

The Mining And Metallurgical Journal

VOL. XXII. No. 5

LOS ANGELES, CAL.,

December 1, 1899,

NEW YORK, N. Y.

Price 15 Cents

ASSAYER and CHEMIST

Mark samples plainly, advise by letter of full details, with charges enclosed. Postage on ore one cent per ounce.

C. H. VOLL,

34 Rowell Bldg.

SEATTLE, WASHINGTON

Oiled and Paraffined Canvas Covering for Machinery, etc.

Tents and Canvas Sheeting

JOHN HARRISON,

167 South Street, - - - New York

PATENTS!

TOWNSEND BROTHERS
SOLICITORS
OF PATENTS
Patents on Inventions secured in all countries. Copyrights, Trade Marks and Labels.
OFFICE, 321 Potomac Block
Telephone 347. Los Angeles, Cal

The Edward P. Allis Company

MILWAUKEE, WISCONSIN

SEE PAGE 11a



DIAMOND Prospecting Drills

Machines of all Capacities

American Diamond Rock Drill Co.,

P. O. Box 1442

120 LIBERTY ST., N. Y.

THE ROESSLER & HASSLACHER Chemical Co.

100 William St., New York

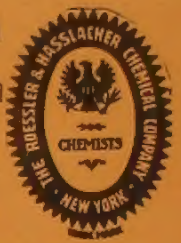
CYANIDE

Peroxide of Sodium

Hyposulphite of Soda

Chloride of Lime

Sulphide of Iron



And Other Chemicals for Mining Purposes.

Joseph Dixon Crucible Co.

MINERS, IMPORTERS AND MANUFACTURERS

GRAPHITE & PLUMBAGO

JERSEY CITY, N. J.

RETORTS, CRUCIBLES, GRAPHITE LUBRICANTS, BELT DRESSING, GRAPHITE PAINTS, LEAD PENCILS, AND GRAPHITE PRODUCTS OF ALL KINDS.

Send for Production Catalogue.

Graphite Makes the Best Lubricant and Best Paint.

ADAMANTINE SHOES & DIES

AND

CHROME CAST STEEL

THE CANDA PATENT SELF-LOCKING CAM. Tappets, Bosses, Roll Shells & Crusher Plates Also Rolled Parts for Huntington and Other Mills

These castings are extensively used in all the Mining States and Territories throughout the world. Guaranteed to prove better and cheaper than any others. Orders solicited subject to above conditions. When ordering send sketch with exact dimensions. Send for Illustrated Circular.

CHROME STEEL WORKS,

Stamp Dies

Kent Ave., Keap and Hooper Sts.,

BROOKLYN, N. Y.

Canda Cam.

The Pelton Water Wheel

Affords the Most Economical and Reliable Power for Mining, Electric and all other purposes.

9000 WHEELS NOW RUNNING

PELTON WATER WHEEL CO., 121 Main St., San Francisco, Cal.

Mexican, American and Foreign Patents, TRADEMARKS, ETC.

Reports on Mining and Other Properties. Proprietors of Weekly Anglo-American, a first-class Advertising Medium. Established 9 Years.

C. H. M. y Agramonte,

P. O. Box 888. Cable Address "Agra"

CITY OF MEXICO, MEXICO



WE are acting as Purchasing Agents for more than thirty mining companies. We desire to make contracts with others to act for them as their Purchasing Agents in this market. Give us an opportunity to send you information and references. We can save you money. Do you wish to receive our Market Letters, giving prices of machinery and supplies, condition of the market, probable change, etc?

1543 Marquette Building,

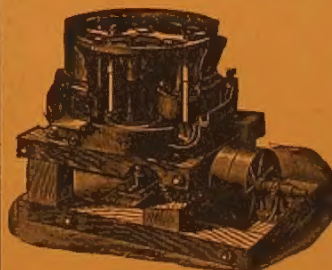
Chicago, Illinois

PARKE & LACY COMPANY

21 and 23 FREMONT STREET, SAN FRANCISCO, CAL.

LICENSEE FOR THE MANUFACTURE AND SALE OF

The Huntington Centrifugal Roller Quartz Mill



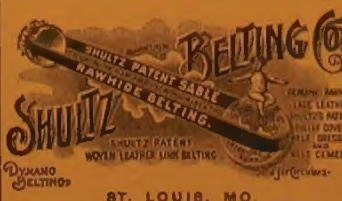
THE HUNTINGTON MILL is so well and favorably known among mining men throughout the world that any description of it would seem superfluous. They are in use in the United States, Canada, Mexico, Central and South America, Australia, China, Japan, and South Africa. In fact, wherever mines exist, and have given the best satisfaction of all quartz crushing mills.

The Construction of this mill has lately been much improved and we claim it to be the CHEAPEST, MOST EFFICIENT, SIMPLEST, AND MOST DURABLE MILL UPON THE MARKET.

Sole Agents for Knowles' Pumps and Pulsometer Pumps, Ingersoll-Sergeant Rock Drills and Air Compressors, Bullock Diamond Drills.

CATALOGUE UPON APPLICATION

Los Angeles, Cal. Office, 306 Byrne Building, W. H. Miller, Representative



JOHN STEWART MINING ENGINEER

Address:—Mining and Metallurgical Journal LOS ANGELES, CAL.

Examines and Reports on Mineral Properties Assessment Work Performed for Non-Residents

RAINBOW BELTING

PEERLESS RUBBER BELTING, made from the celebrated Rainbow composition, which is peculiarly adapted for **Dry Climates**, is not affected by **Dampness** and especially designed for heavy service. Every belt tested before leaving factory.

500,000 Feet Sold During 1898
Not a single Belt Returned



Also try the well known "Peerless" Brands. Air Drill, Steam, Water, Suction, Fire Hose. Rainbow Sheet Packing. Peerless Piston Packing. Honest John Packing. Hercules Metallic Stop Valve Packing.

PATENTED AND MANUFACTURED
EXCLUSIVELY BY

The Peerless Rubber Mfg. Co., 16 WARREN STREET, NEW YORK

16-24 Woodward Avenue, Detroit, Mich. 202-210 S. Water Street, Chicago, Ill.
Dunham, Carrigan & Hayden Co., San Francisco, Cal.

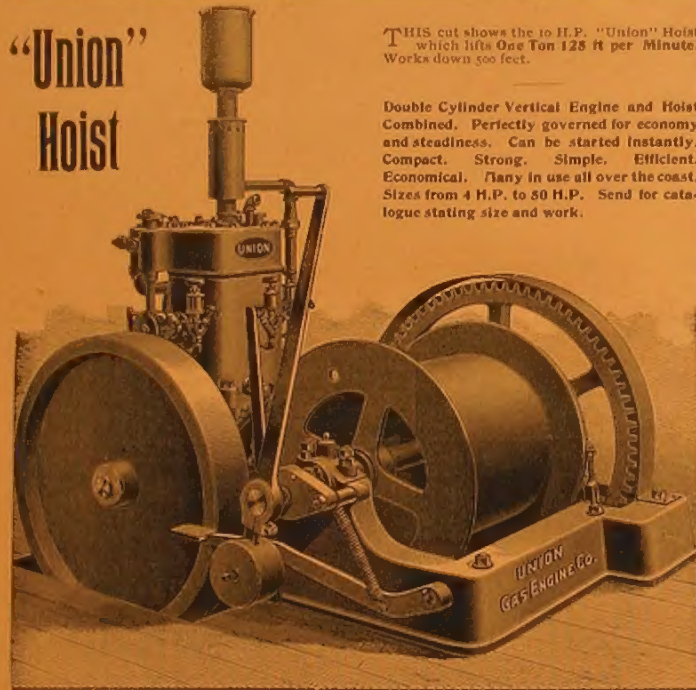
California Vigorit Powder Co.

Manufacturers of

Dynamite High Explosives and "Vigorit Low" Blasting Powder

OFFICE: 208 California Street,
San Francisco, Cal.

WORKS: Point Isabel,
Contra Costa Co. Cal.



**"Union"
Hoist**

THIS cut shows the 10 H.P. "Union" Hoist which lifts One Ton 125 ft per Minute. Works down 500 feet.

Double Cylinder Vertical Engine and Hoist Combined. Perfectly governed for economy and steadiness. Can be started instantly. Compact. Strong. Simple. Efficient. Economical. Many in use all over the coast. Sizes from 4 H.P. to 50 H.P. Send for catalogue stating size and work.

Union Gas Engine Co.,

801 Howard Street, - - - San Francisco, Cal.

The only Genuine **ALBANY GREASE** has this TRADE MARK on every package. Look out for Yellow Label.



MANUFACTURERS OF

Albany Dynamo & Albany Cylinder Oils
If you are not using these Oils give them a trial at once, and we know the result. You will want no other.

ALBANY GREASE

Lubricates Everything

Especially Adapted to Mining and Milling Machinery.

—MADE ONLY BY—

ADAM COOK'S SONS,
313 WEST ST., NEW YORK.

BRANCHES:

TATUM & BOWEN,
34 Fremont Street, San Francisco, Cal.
43-49 First St., Portland, Oregon.

South Canal Street, Chicago, Illinois.

THOMPSON & BOYLE CO.

(INCORPORATED)

MANUFACTURERS OF

STEEL MINING PIPE

**Cyanide Tanks, Water Tanks, Air Pipe,
Hydraulic Mining Material**

310-314 Requesena St.,

Los Angeles, Cal.

WILLIAM H. EMANUEL,

REPRESENTING

RAND DRILL COMPANY,
THE EDW P. ALLIS CO.,

Air Drills and Compressors
General Mining, Milling and Smelting

TRENTON IRON CO.,

Machinery and Reynolds Corliss Engine

HENRY R. WORTHINGTON,

Wire Rope and Bleichert Tramways

ROBIN'S BELT CONVEYOR

DENVER

COLORADO

The Baker & Adamson Chemical Co.

MANUFACTURERS OF

Strictly Chemically Pure Acids and
Chemicals and Ashless Filter
Papers

BOSTON,

PENNSYLVANIA

Just Published

Manual of Hydraulic Mining

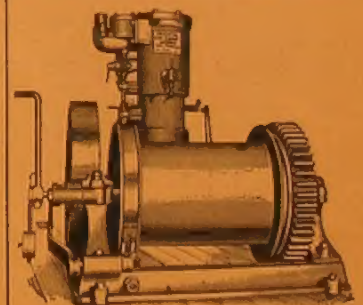
FOR THE USE OF THE

PRACTICAL * MINER

By T. P. VAN WAGENEN

NEW AND REVISED EDITION
16mo, cloth, \$1.00.

D. VAN NOSTRAND CO., Publishers
23 Murray and 27 Warren Sts., NEW YORK
Copies sent by mail or express on receipt of price



ORIENTAL HOIST

Any Size Built on Demand
Simplest and Best Mining Hoist Built
Write for Particulars and Prices

Oriental Gas Engine Co.

227 and 229 Polson Street,

SAN FRANCISCO, U. S. A.

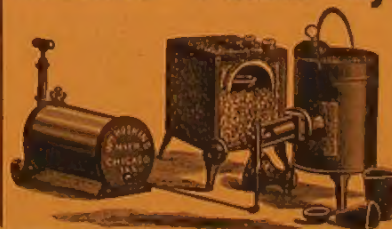
Hoskins' Patent Hydro-Carbon

Blow-Pipe and Assay Furnaces

No dust. No ashes. Cheap, effective, economical, portable and automatic. Send for Price-list to

WM. HOSKINS,

81 South Clark St., Room 57
CHICAGO, ILL.



A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y
Abbott, W. O. 1a Aggravante, C. H. M. Y. 1a Ainsworth, Wm. & Sons 12a Aitchison Perforated Metal Co., The Robert 15a Allis Co., Edward F. 11a Alexander & Sons, Theo. 14a American Diamond Rock Drill Co. 1a American Injector Co. 17a Aubury, L. H. 6a	Daily & Monnig 17a Haker & Adamson Chemical Co. 2a Baker & Co. 2a Baker Iron Works 12a Beckley & Co., A. J. 14a Bell, Newton M. 6a Berger & Sons, C. L. 18a Bl Metalle Assay Office 18a Rickford Drill Co. 15a Altin, Chas. T. & Co. 1a Bradley-Ransome Lumber Co. 18a Brands & Son, F. R. 7a Braun Co., R. W. 3a Brown Horace F., M. R. 17a Brownell, James S. 17a Buck Manufacturing Co., M. M. 17a Bullock Mfg Co., M. C. 17a Burlingame, R. K. 3a	California Perforating Screen Co. 8a California Anti-Caloric Co. 1a California Vigorite Powder Co. 2a Chambers Sec'y, J. C. 5a Chapman Smelting Works Co. 18a Chester Steel Castings Co. 1a Chrome Steel Works 1a Cleveland Mining and Stock Exchange Co. 8a Cling-Surface Manufacturing Co. 1a Colorado Iron Works Co. 11a Cook's Sons, Adam 2a Con. Kansas City Smelting & Refining Co. 16a Courts, Wm. M., A. M. 17a Cummer & Sons Co., F. D. 6a	Davis Iron Works Co., F. M. 15a Denniston, E. G. 16a Denver Engineering Co. 11a Denver Fire Clay Co. 12a Denver Variety Machine Shop. 12a Detroit Lubricator Co. 12a Diezgen & Co., Eugene 4a Dixon Crucible Co., Jos. 15a Dixie Iron Works Co. 16a Ducum, C. 15a	Elmer & Amend. 17a Emanuel, Wm. H. 17a Eynon-Ryans Manufacturing Co. 19a	Fay & Bagan Co., J. A. 12a Ferrari, Guido 14a Fossil Meal Co. 15a Fowler, G. C. 16a Pulton Engine Works. 17a Fraser & Chalmers 17a Freese, Adolf 16a Frue Vanning Machine Co. 16a	Globe Machine Works 15a Godfrey, A. G. 4a Gold & Silver Extract Co. of America Ltd. 6a Goodell Packing Co. 15a Goodyear Rubber Co. 12a Gutta Percha Rubber and Mfg Co. 12a	Hamlin & Morrison 14a Harrison, John 1a Hercules Gas Engine 7a Hendy Machine Works, Joshua 13a, 14a Henshaw, Bulkeley & Co. 12a, 13a, 14a, 15a, 16a Hersey, Clarence 2a Hoskins, Wm. 2a	Independent Assay Office 13a Intergal Sergeant Drill Co. 8a Irving & Co., Jas. 8a	Jackson Drill and Manufacturing Co., The. 8a Jeffrey Manufacturing Co. 12a	Keuffel & Esser Company 5a, 15a Kimball, S. D. 16a Kimbush, Sr. Herman 16a	Leffel & Co., James 17a Lehigh University 19a Lexow, Theo. 15a Lidgerwood Manufacturing Co. 15a Link Belt Machinery Co. 15a Little Alaska Gold Washer 15a	Macbeth & Co., James 12a McKelvey, Chas. S. 14a McNamara, Geo. G. 16a McCoy J. W. 17a Malt Dry Gold Saver 17a Manasse Co., L. 16a Mathison & Co. 16a Metcalf, Thomas & Co. 16a Morgan-Watson Mining & Construction Co. 8a Moore & Co Chas. C. 8a Mould & Co., Henry S. 6a	National Association of Stationary Engineers 15a National Iron Works 17a National Pipe Bending Co. 14a New Haven Manufacturing Co. 14a New Standard Co., (Inc.) 13a Nicholson & Co. 16a Norwalk Iron Works 16a	Ogden Assay Office 4a Oliver Powder Co. 13a Oriental Gas Engine Co. 2a	Pacific Tank Co. 13a Parafine Paint Co. 18a Parke & Lacy Co. 1a, 18a Pelton Water Wheel Co. 1a Penn Smelting and Refining Co. 18a Peres, R. A., & M. 2a Peerless Rubber Manufacturing Co. 12a Price & Son, Thos. 16a Pulsometer Steam Pump Co. 17a	Queen & Co. 12a Quick, John W. 12a	Reckhart, D. W. 15a Reed, John T. 14a Ricketts & Bank 15a Roessler & Haslachner Chemical Co. 1a Robins' Conveying Belt Co. 16a Russell & Kinney 16a	Santa Fe Route 15a S. F. Pioneer Screen Works 15a Schaefer, Wm. E. 14a Schoellkopf, Hartford and MacLagen, Ltd. 17a Shaw, Willie 14a Shultz Belling Co. 16a Selby Smelting & Lead Co. 12a Simonds & Vainwright 16a Smith & Co, Francis 1a Smith & Thompson 1a Southern California Lumber Co. 13a S. S. Machinery Co. 12a State Ore Sampling Works 17a Stewart, John 1a Sullivan Machinery Co. 11a Surman & Co., J. R. 15a	Tatum & Bowen 6a Taylor & Co., John 16a Taylor Iron and Steel Co. 6a Temple Machine Co. 15a Thomson & Boyle 2a Townsend Bros 1a Trenton Iron Co. 1a Troemner, Henry 12a Truax Manufacturing Co. 16a	Union Gas Engine Co. 2a	Van Der Nallien, A. 2a Van Nostrand Co., D. 2a Van Wageningen, Theo. F. 2a Voll, C. H. 1a	Wade & Wade 17a Watson, R. N. 18a Weber Gas and Gasoline Engine Co. 2a Weber & Co., F. 2a Weigels Pipe Works 17a Weis & Gibson 12a Western Chemical Co. 18a Western Forge & Rolling Mills 17a White Rogers & Co. 17a Wigmore & Sons, Co. John 18a Wonder Pump Manufacturing Co. 16a Wood, Henry E. 16a Woodbury Concentrator Co. 8a	Yawger, J. C. 1a Young & Sons 1a	

To Identify Crude Platinum when found, send 75c for Sample in glass, packed in a strong box. We purchase or refine anything containing Platinum.

BAKER & COMPANY.

NEW YORK OFFICE: 110 Liberty Street.

NEWARK, NEW JERSEY

E. E. BURLINGAME & CO.,
ASSAY OFFICE AND **CHEMICAL**
LABORATORY
 Established in Colorado, 1866. Samples by mail or
 express will receive prompt and careful attention.
Gold & Silver Bullion Refined, Melted and Assayed
OR PURCHASED.
Concentration Tests—100 lbs. or car load lots.
 Write for terms.
 1736-1738 Lawrence St., Denver, Colo.

Engineers' and Draughtsmen's Supplies

Sole agents for Riefler's round system drawing instruments and Albert Ott's Planimeters, Plantographs and other instruments of precision. Levels and transits of superior make.

F. WEBER & CO.
1125 CHESTNUT ST. PHILADELPHIA

WM. E. SAVAGE.

Land and Mining Attorney.
Will conduct causes before United States and State Courts, or U. S. Local Land Offices, in any mining State or Territory of the United States or before the U. S. General Land Office, Washington, D. C. **Mining Properties and Oil Lands Bought and Sold.**
Office, Room 216 Douglas Building, 3d and Spring
LOS ANGELES, - - - CAL.
Established 1885.

J. W. McCOY,
Consulting Mining Engineer,
1202 Owings Building, Chicago, Ill.
Examinations and Reports on Mining Properties

*** SCHOOL OF ***
Practical Mining, Civil, Mechanical,
Electrical Engineering, Metallurgy,
Cyanide Process, &c.
 Surveying, Architecture, Drawing and Assaying.
933 MARKET ST. SAN FRANCISCO, CAL.
OPEN ALL YEAR
A. VAN DER NAILLEN, President.
 Assaying of Ores, \$25; Bullion and Chlorination
 Assay, \$35; Blowpipe Assay \$10. Full Course
 of Assaying, \$50. Established 1864.
 Send for Circular.

Al.-- WEBER Hoist is always --Al.

And they Always
Give Satisfaction
* *

The Buena Vista Smelting & Refining Company,
B. F. MORLEY, Manager

BUENA VISTA, CALIF. Sept 13-1898.

Weber Gas & Gasoline Engine Co.,

Kansas City, Mo.

Gentlemen:-

Replying to your favor of the 12th inst: I have not time to write an extended letter. You may, however, quote me as saying that the hoist is A 1 in every respect, and entirely satisfactory.

Yours truly,

The Buena Vista S. & R. Co.,

B. F. Morley

MEX

Runs on Gasoline, Distillate or Kerosene, Sizes 4 to 100 H. P.

Get our New Catalogue—Tell us your requirements and we will save you some money Hoisting or Pumping or Running any kind of Machinery.

The Weber Gas and Gasoline Engine Co.

434 S. W. Boulevard,
Kansas City, Missouri

The CALIFORNIA ANTI-CALORIC COMPANY
Steam Pipe and Boiler Covering
 Manufactured under our own Patents and solely from California Products.
ANTI-CALORIC PLASTER; the best and cheapest insulating
 Plaster in the Market.
 Factory, Potrero Tel. Main 5734 **OFFICE: 217-219 Mission St., San Francisco**

CHAS. C. MOORE & CO.

ENGINEERS AND DEALERS IN

BABCOCK & WILCOX BOILERS, GREEN'S ECONOMIZERS,
McINTOSH & SEYMOUR ENGINES, WHEELER CONDENSERS,
HAMILTON CORLISS ENGINES, BARNARD-WHEELER COOLING TOWERS,
N. Y. SAFETY AUTOMATIC ENGINES, HOPPE'S LIVE STEAM PURIFIERS,
GOUBERT FEED WATER HEATERS, EDMISTON FEED WATER FILTERS,
STRATTON STEAM SEPARATORS, BUNDY STEAM TRAPS,
SNOW STEAM PUMPS, SPENCER DAMPER REGULATORS,
QUIMBY SCREW PUMPS, HYATT ROLLER BEARINGS.

Watch this Space for description of the above Machinery.

Send for Catalogue and Full Information.

32 First Street, San Francisco, Cal.

GOODYEAR'S RUBBER GOODS

Miners and Mining

GATHERING RUBBER, Crack Proof Boots, White Rubber Coats, Oil Clothing

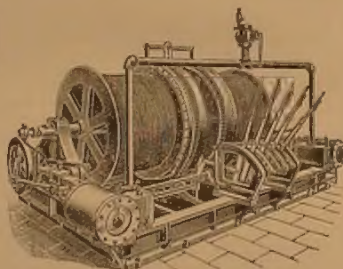
BELTING, PACKING AND HOSE

573, 575, 579 Market Street, SAN FRANCISCO, CAL. **R. H. PEASE,** 73 and 75 First St. PORTLAND, OREGON
Vice President and General Manager.



Lidgerwood Hoisting Engines

Built to gauge on the Duplicate Part System. Quick Delivery Assured.



Mine Hoists,

STEAM AND ELECTRIC
CABLEWAYS Hoisting and Conveying Devices

SEND FOR CATALOGUE

Lidgerwood Mfg. Co.

96 Liberty Street,

New York

HENSHAW, BULKLEY & CO, Agents, San Francisco.

Metcalf, Thomas & Co., INVESTMENT & MINING BROKERS

Official Agents of the Black Hills Copper Co., Ltd.

OF JEROME ARIZONA.

LONDON AGENCY: Suffolk House
Cannon St., E. C., London, England.

224 DOUGLAS BLOCK,

Cable Address, METCALF.

LOS ANGELES, CAL.

LINK-BELT Elevators and Conveyors



Coal Conveyor, 328 ft. center handling 4 tons run of mine coal per minute

Electric Coal Mining and Haulage Machinery.

Complete Tipples-house equipment, Coal Washing Machinery, Shafting, Pulleys, Shaft Bearings, Friction Clutches, Gearing, etc.

SEND FOR CATALOGUE

The Link-Belt Machinery Co.

ENGINEERS, FOUNDERS, MACHINISTS

CHICAGO, U. S. A.

DENVER:

1328 17th Street

A. E. LINDROOTH, Manager

BUY

ANTIMONY ORES AND
CRUDE ANTIMONY

WRITE FOR FULL PARTICULARS



The Mail Dry Gold Saver...

The only thoroughly practical DRY WASHER ever invented, will save a larger per cent. of gold than any other machine. It is Cheap, Light and Durable.

The material used in its construction is of the best, well bolted and screwed (not nailed) together. Woodwork, spruce; lining, galvanized iron; riffle screen, No. 70 mesh, brass wire.

Small size \$35, medium size \$40, large size \$50.

A. G. GODFREY, Manufacturer,

206 S. Los Angeles St. Los Angeles, Cal.

EUGENE DIETZGEN CO.
181 MONROE STREET, CHICAGO.
149-151 FIFTH AVE., NEW YORK, N.Y.
MANUFACTURERS AND IMPORTERS OF
ENGINEERING AND
DRAWING INSTRUMENTS
of every description.
We carry Largest Stock in the West.
New 224 PAGE ILLUSTRATED
CATALOGUE sent on application



Reliable Assays

Gold	\$.50	Copper	\$1.00
Silver40	Gold, Silver and Lead ..	1.25
Gold & Silver ..	.75	Gold, Silver, & Copper ..	1.50
Lead50	Gold, silver, copper, lead ..	2.00

Samples by mail receive prompt attention.
Highest price paid for Bullion.

Ogden Assay Co.,

1420-16th Street, Denver, Colo.

MACHINERY
NEW AND 2ND HAND
FOR SALE CHEAP
Hoisting Engines, Air Compressors, Rock Drills, Crushers, Dump Cars, Steam Shovels, Light Locomotives, Relaying Rail, etc. Send for printed leaflet just issued.
WILLIS SHAW, 629 N.Y. Life Bldg., CHICAGO
SUGGESTION TO
I. C. YAWGER, VICTOR BISHOP & CO.



31 Maiden Lane, New York

MATHISON & CO.

25-27 CEDAR ST.,
NEW YORK CITY

--- ANTIMONY ---

BOOKS ON MINING & METALLURGY.

A CAREFULLY SELECTED LIST OF STANDARD WORKS FOR PRACTICAL MINERS, METALLURGISTS,
MINING ENGINEERS AND METAL MANUFACTURERS.

A Handbook of Metallurgy. By Carl Schnabel, translated by Henry Louis, two volumes, illustrated, medium 8vo. **\$10.00 net.**
Vol. I.—Copper, Lead, Silver, Gold. Vol. II.—Zinc, Cadmium, Mercury, Bismuth, Tin, Antimony, Arsenic, Nickel, Cobalt, Platinum, Aluminum.

The German original is acknowledged to be the best existing work on the subject, and this new translation picks the advantages of being up-to-date, to its facts and absolutely modern in its descriptions of methods of treatment, etc.

The translators name has long been connected with mining and kindred subjects through his book on "Gold Mining."

A Manual of Practical Assaying. By H. Van P. Furman. Fourth edition with five Appendices on most recent methods. 8vo, cloth. **\$3.00**
Contents.—Part I. Introductory. Part II. Determinations. Part III. Special Assays and Analysis. Part IV. Calculations.

Cyanide Processes for Gold and Silver Ores. By E. B. Wilson, E. M., 12mo, cloth. **\$1.50**
Contents: Introduction—Chapter I. Stamp mill-work; II. Amalgamation; III. Foundation of Cyanide Process; IV. Chemistry of the Operation; V. Leaching the Ore; VI. Zinc as a Precipitant; VII. Treatment of Bullion; VIII. The Recovery by the Cyanide Process; IX. Laboratory Work; X. Gold and Silver solvents Combined with Electrical Action; XI. Cyanide Solution with various Electrodes; XII. The Current; XIII. Anodes; XIV. Cathodes; XV. Various Processes and Conclusions; Author's; Useful Information.

Notes on Assaying. By P. De Peyster Ricketts, E. M. Ph. D. and Edmund H. Miller, A. M. Ph. D., 8vo., cloth. **\$3.00**
Prepared with special reference to the wants of the student and practical assayer. Containing also Instructions for laboratory tests by Cyanide, Chlorination, Russell Process, etc.; Assayers' Outfit, Rapid Volumetric Methods for the Analysis of Ores, etc.

The Alloys and their Constituents. By Prof. Robt. H. Thurston, Cornell University. Second edition. 8vo., cloth. **\$2.50**
Copper, Tin, Zinc, Lead, Antimony, Bismuth, Nickel, Aluminum, etc.; The Brasses, Bronzes, Copper-Tin-Zinc Alloys; Other Valuable Alloys, Their Qualities, Peculiar Characteristics; Uses and Special Adaptations; Thurston's "Maximum Alloys"; Strength of the Alloys as Commonly made and as affected by special conditions; The Mechanical Treatment of Metals.

Notes on the Treatment of Gold Ore. By Florence O'Driscoll, 8vo, cloth. **\$2.00**
"It is an interesting discussion of the properties of gold, its occurrences, the methods of procedure in mining in late years, with the losses incident thereto and remedies for the same. The main object in presenting the work has been to make clear a few misconceptions on the subject, the most fatal of these being that any one method of treatment is efficacious in dealing with all classes of gold ores."—*American Manufacturer*.

The Chlorination Process. By E. B. Wilson, E. M., 12mo, cloth. **\$1.50**
Contents: Lixivation by Chlorine Solutions; Preparation of the Ore-Roasting Furnaces; The Leaching Process; Filtering; Precipitation; Refining the Precipitates; Resume of Chlorination and Plant, Cost of Chlorination.

Metallurgy of Silver, Gold, and Mercury in the United States. By Prof. Thos. Eggleston, School of Mines, Columbia University. With corrections. Vol. I.—Silver, 8vo. **\$7.50**
Showing the latest practice pursued in American Metallurgical Establishments. With 186 engravings and folding plates, tables, etc.

Vol. II.—Gold, Mercury, etc. Illustrated with 140 engravings and folding plates, 935 pages, 8vo, cloth. **\$7.50**
These treatises cover the whole range of the metallurgy of silver, gold and mercury in this country; and in a clear, pleasing and interesting manner convey information of exceeding value to all in any manner interested in the production of these precious metals.—*Engineering News*.

Iron and Steel. By Prof. Robt. H. Thurston, Cornell University. Sixth Edition, revised 8vo, cloth. **\$3.50**
The Ores of Iron; Methods of Reduction; Manufacturing Processes, Chemical and Physical Properties of Iron and Steel; Strength, Ductility, Elasticity, and Resistance; Effects of Time, Temperature and Repeated Strain; Methods of Test; Specifications.

"Should be in the hands not only of all Engineers but of all Mine owners and Metallurgists as well."—*Mining Review*.

The Coal Mines of the Western Coast of the United States. By W. A. Goodyear. 12mo, cloth. **\$2.50**

Practical Mine Ventilation. By E. B. Wilson, M. E. Fifth edition with plates, 16mo, cloth. **\$1.25**
For the use of Mining Engineers, Students and Practical Men.

"We recommend it heartily to our Mining community."—*Colliery Guardian (London)*.

Hydraulic and Placer Mining. By E. B. Wilson, M. E., 12mo, cloth. **\$2.00**
Contents: Uses of Water in Mining; Geology of Placer Deposits; Gold Recovery by various methods, Panning, Cradles, Long Tom, Booming, Sluicing, Riffles, Flumes, Ditches, Dams, Pipes, Glants, Valves, Gates, Wiers, Miner's Inch, Pressure Box, Dams, Gravel Elevators, Exploiting, Dredging Rivers, Traction Dredgers; Appendix containing Location of Claims and General Information.

The Modern High Explosives—Nitro-Glycerine and Dynamite. By Manuel Bissler, Mining Engineer. With many illustrative plates. Third edition. 8vo, cloth. **\$4.00**
Their Manufacture, their Use and their Application to Mining and Military Engineering; Pyroxyline or Gun Cotton, the Fulminates, Picrates, and Chlorates; also, the Chemistry and Analysis of the Elementary Bodies which enter into the Manufacture of the principal Nitro-Compounds.

The Ventilation of Mines. By J. T. Beard, C. E., E. M., Secretary of the State Board of Examiners for Mine Inspectors, Iowa. 12mo, cloth. **\$2.50**
Designed for use in Schools and Colleges and for practical mining men in their study of the subject.

Manual of Mining. By Prof. Magnus C. Ihlseng, E. M., Ph. D. Third edition, revised and enlarged. 8vo, cloth. **\$4.00**

For the use of Mining Engineers and Technical Schools. Treating of Preparatory and Exploratory Work, Methods of Mining, Hoisting Machinery, Pumping, Ventilation Shafts, Tunnels, Blasting, Timbering, etc.

The text has been increased by more than fifty pages in order to introduce additional matter pertaining to the design of cars hoisting appliances and fans.

Catalogue of American Localities of Minerals. By E. S. Dana. Reprinted from sixth edition of the System. 8vo, cloth. **\$1.00**

A Description of Minerals of Commercial Value. By D. M. Barringer, A. M., LL. B. 168 pages. Oblong, morocco binding. **\$2.50**

A Practical Reference Book for the Miner, Prospector and Buyer of Minerals, or any Person who may be interested in the extraction or treatment of the Various Metallic or Non metallic Minerals and for Students either in Field work or Laboratory.

An Introduction to the Study of Metallurgy. By W. C. Roberts Austen, C. B., F. R. S. New Fourth Edition, Revised and enlarged. With 90 illustrations. Crown octavo. Cloth. **\$5.00**

For those who are beginning to study Metallurgy this work is a desirable guide to a knowledge of the principles by which the art is rightly practiced. The author treats the subject as a whole, giving no minute descriptions of processes, but choosing typical appliances and indicating their use in connection with groups of metals.

"No English text-book at all approaches this in the comprehensiveness with which the most modern views on the subject are dealt with."—*Chemical News*.

The Metallurgy of Iron. By Thomas Turner, Associate of the Royal School of Mines. Illustrated by 80 engravings, octavo, 381 pages, cloth. **\$5.00**
This book is primarily intended for persons who are connected with the manufacture of iron and steel, and who may be assumed to have already some general knowledge of the subject discussed. At the same time the volume may not be without interest to others than those for whom it was specially prepared.

A most valuable summary of useful knowledge relating to every method and stage in the manufacture of cast and wrought iron. An exhaustive and really needed compilation."—*Bulletin of the American Iron and Steel Association*.

A Treatise on Mine-Surveying. By B. H. Brough, Associate of Royal School of Mines. With 102 illustrations. Octavo. 340 pages, Cloth. **\$2.50**
The work is intended primarily for students; and at the same time, it will also be found useful as a companion to the standard works of reference on land-surveying. The methods of surveying in the Pennsylvania anthracite mines are fully dwelt on, and, the most recent forms of American instruments are described and illustrated. A description is also given of the methods adopted in the survey of metalliferous mine-claims in the Western United States.

"It is the kind of book which has long been wanted, and no English speaking mine agent or mining student will consider his technical library complete without it."—*Nature*.

A Text-Book of Ore and Stone Mining. By C. Le Neve Foster, B. A., D. Sc., F. R. S. With Frontispiece and 716 illustrations. Large Octavo, cloth. **\$10.00**

A Text-book of ore and stone mining, for the use of mine owners, mine managers, prospectors and all interested in ore and stone mining.

"Mining engineering is at last adequately treated in this volume, and the different kinds of work that have to be done by the miner in the way of surveying, exploiting, drainage, ventilation, lighting, etc., as well as in the treatment of ores after their excavation, are all very fully treated. The book is adequately illustrated and excellently indexed. One section is devoted to legislation affecting mines and quarries, while another chapter is devoted to the condition of the miners, their modes of life, and the means for ameliorating their condition and elevating them."—*Scientific American*

Prospecting for Minerals. A Practical Handbook for Prospectors, Explorers, Settlers and all interested in the Opening-up and Development of New Lands. By S. Herbert Cox. With illustrations. Large crown octavo. **\$2.00**
The object of this volume is to give a sketch of those subjects which underlie the calling of the prospector without encroaching to any great extent upon the provinces occupied by the sciences of mineralogy and geology or the arts of mining and metallurgy. To the practical prospector it may give certain hints as regards the recognition of minerals with which he is unacquainted, while to the student it may afford an introduction to the subjects which will be of use in directing his work into the proper channels.

Sent Post Paid to any address on receipt of Price.

The Metallurgy of Gold. By T. Kirk Rose, B. Sc., Edited by Prof. W. C. Roberts-Austen, C. B., F. R. S. Third edition, Revised. Including the most recent improvements in the Cyanide Process, and a new chapter on Economic Considerations (Management, Cost, Output, etc.) With frontispiece and additional illustrations. Large octavo, handsomely cloth. **\$6.50**

Adapted for all who are interested in the gold mining industry, being free from technicalities as far as possible; of especial value to those engaged in the industry,—viz., mill-managers, reduction-officers, etc.

A feature is the description of exact methods employed in particular extraction works—Stamp batteries of South Africa, Australia, New Zealand, California, Colorado and Dakota; Chlorination works, also, in many parts of the world; Cyanide works of South Africa or New Zealand. These accounts are of special value to practical men.

Getting Gold. A Gold Mining Hand-Book for Practical Men. By J. C. P. Johnson; F. G. S., A. I. M. E. With illustrations. Crown octavo, cloth. **\$1.50**

A compendium, in specially concrete form, of useful information respecting the processes of winning from the soil and after-treatment of gold and gold ores, including some original discoveries by the author. Practical information, original and selected, is given to mining company directors, mine managers, quartzmill operators, and prospectors.

A Text-Book of Assaying. By C. and J. J. Beringer. For the use of those connected with mines. Third edition. With numerous Diagrams and Index. Crown octavo. 400 pages. Cloth. **\$2.25**

Prepared to meet the existing want of a practical "handy-book" for the assayer. The author has given the results of a series of experiments showing the effect of varying conditions on the accuracy of the process. Statements like those generally made, that "this or that substance interferes," are insufficient. It is necessary to know under what conditions and extent.

A really meritorious work, that may be safely depended upon either for systematic instruction or for reference.—*Nature*.

Blasting. By Oscar Guttman, Assoc. M. Inst. C. E. A Hand-Book for the use of Engineers, and others engaged in Mining, Tunneling, Quarrying, etc. With 136 illustrations. Octavo, cloth. **\$3.50**

Mr. Guttman's "Blasting" is the only work on the subject which gives full information as to the new methods adopted since the introduction of dynamite, and, at the same time, the results of many years practical experience both in mining work and in the manufacture of explosives. It therefore presents in concise form all that has been proved good in the various methods of procedure.

Elements of Metallurgy. A Practical Treatise on the Art of Extracting Metals from their Ores. By J. Arthur Phillips, M. Inst. C. E., F. C. S., F. G. S., etc. With 238 illustrations, drawn to scale, and reduced in many instances from working drawings. Royal octavo, 909 pages, cloth. **\$9.00**

Contents: A Treatise on Fuels and Refractory Materials. A Description of the Principal Metallurgical Minerals, with their Distribution. Statistics of the amount of each Metal annually produced throughout the world, obtained from official sources, or, where this has not been practicable, from authentic private information. The Methods of Assaying the different Ores, together with the Processes of Metallurgical Treatment comprising Iron, Cobalt, Nickel, Aluminum, Copper, Tin, Antimony, Arsenic, Zinc, Mercury, Bismuth, Lead, Silver, Gold and Platinum.

Tables for the Determination of Minerals. By Physical Properties ascertainable with the Aid of a few Field Instruments. By Percifer Frazer. Fourth edition, to which 140 additional species have been added. 12mo, cloth. **\$1.50**

"The purpose of this book is to aid the student in determining minerals by their physical properties as distinguished from the chemical reactions which they give. That it is possible so to manage tables that it shall be in the main possible by their use, for the student to determine a mineral from its color, luster, streak, hardness, crystalline form, and cleavage, has been shown by the reception which this book has had through its various editions."—*New York Science*.

Electric Smelting and Refining. A Practical Manual of the Extraction and Treatment of Metals by Electrical Methods. The "Elektro-Metallurgie" of Dr. W. Borchers, translated by Walter G. McMillan, F. I. C., F. C. S. With numerous illustrations and folding plates. Large octavo. **\$6.50**

Dr. Borchers's treatise is practical throughout. It confines itself to one branch of electro-chemistry,—viz., electrolysis, a subject which is daily becoming of more and more importance to the practical metallurgical and manufacturer. In the extraction of Aluminum, the refining of copper, the treatment of gold and other metals, electrical processes are fast taking the place of the older methods.

"Dr. Borchers's well-known work . . . must of necessity be acquired by every one interested in the subject. It is excellently put in English, with additional matter by Mr. McMillan."—*Nature*.

The Story of American Coals. By William Jasper Nicolls, M. Am. Soc. C. E. Buckram, gilt top, deckle edges, with complete index. **\$3.50**

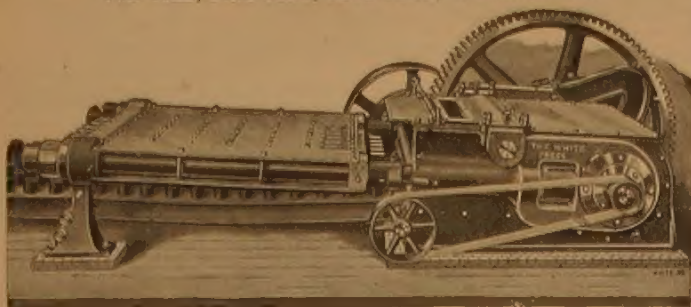
"It is as much historical as scientific, and scientific without being at all technical. The author, Mr. Nicolls, has adopted a pleasing simple style of writing which causes the reader to be loath to lay the book down until it is finished."—*Phila. Ledger*.

We will endeavor to secure, for subscribers and customers, any other book on Mining, Metallurgy and kindred subjects.

Address, Book Department, THE MINING and METALLURGICAL JOURNAL, 32 Broadway, New York City.

The White Briquetting Press

FOR COAL, FINE ORES, FLUE DUST, CONCENTRATES



SOLE LICENSEES TO SELL AND OPERATE

The Henry S. Mould Company,

Carnegie Building

PITTSBURG, PA., U. S. A.

CYANIDE PROCESS

The McArthur-Forrest Cyanide Process
IS THE BEST

For the Treatment of Refractory and Low Grade Gold and Silver Ores and Tailings. We are the Originators of the Cyanide Treatment, and have kept up with the times in all improvements in Cyanide Methods.

Successful Plants in Operation in all Western Mining States. Samples Assayed and Fully Reported upon. Properties Examined. Designs furnished. For Terms and Particulars, Address

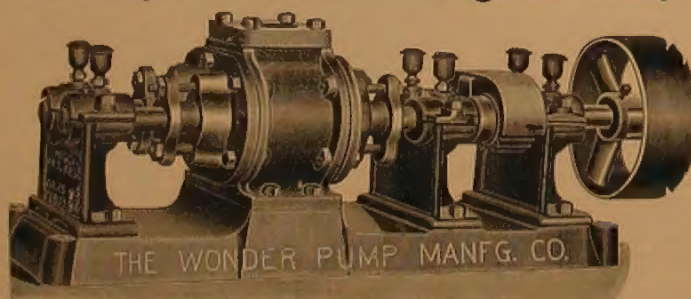
THE GOLD AND SILVER EXTRACTION CO., of America, Ltd.
GEO. A. ANDERSON, General Manager

Testing Works: 1716 Blake St., Denver, Colo. 208-210 McPhee Building, Denver, Colorado.
JESSE J. MacDONALD, Agent, 127 W. First St., Los Angeles, Cal.

KEUFFEL & ESSER CO.
NEW YORK.
127 FULTON AND 42 ANN STS.
Branches: 111 Madison St., Chicago; 708 Locust Street, St. Louis, Missouri

Drawing Materials and Surveying Instruments
largest and best assorted stock in America. All requisites for field, mine, and draughting room. We have made a study of this line, and our goods are warranted to be as nearly perfect as it is possible to make them. Prices reasonable. Write for catalogue.

The Improved WONDER Irrigation Pump



We also Build Vertical Style for Mining Purposes.
Write for full particulars and Catalogue.

Wonder Pump Mfg Co., LEAVENWORTH, Kansas.
MACHINERY & ELECTRICAL CO., Los Angeles, Cal., Agents for California.

SEE OUR ... BOOK LIST ... ON PAGE 8a

If there is a book you need which we have not listed, write to the JOURNAL BOOK DEP'T.

YOUNG & SONS.,

Manufacturers of

Engineering, Mining and Surveying Instruments. Noted improvements in Auxiliary Telescopes for vertical sighting in mines. Makers of the inclined standard transits. Non-Extension Telescopes, moisture and dust proof. Write for special circulars of mining transits.
43 N. Seventh St., Philadelphia Penn.

SAVE MONEY!



FUEL COSTS MONEY
Protect your pipes and boilers with Wm. Berkfeld's Fuel-oil meal composition, packed in sacks, easy to transport anywhere. Send for facts and figures.
FUEL OIL MEAL CO.
2 Cedar Street, New York

Lew E. Aubury,

Mining Engineer,

ASSAY OFFICE,

118 W. First Street, Los Angeles, Cal.

FRANCIS M. SIMONDS, R. M., Ph. D.
Chemical and Mining Engineer,
METALLURGICAL CHEMISTRY

J. HOWARD WAINWRIGHT, Ph. D., F. C. S.
(late U. S. Gov't Chemist, N. Y., 1881-1888.)
COMMERCIAL AND TECHNICAL ANALYSIS

SIMONDS & WAINWRIGHT,
Chemical, Mining Engineers and Analysts,

Telephone 1015 Jehu. Office and Laboratories: No. 150 Front St., New York City.
SPECIALTIES: Analysis and Tests of Minerals—Engineering—Examinations of Mining Properties—Experimental Research and Consultation.

WEBBER PATENT COMPRESSION GRIP

IS USED ONLY ON THE PATENT



No lug or knots of any kind required on the traction rope, giving longer service, and saving in repairs.

Illustrated book upon application

Bleichert Wire Rope Tramway,

AND OTHERS, MANUFACTURED BY

THE TRENTON IRON COMPANY,
TRENTON, NEW JERSEY.

ENGINEERS AND CONTRACTORS

AND

Sole Licensees in North America for the Bleichert System

Also, Wire Rope Equipments

for Surface and Underground Haulage, Transmission of Powers, Etc.

NEWTON M. BELL, AGENT

308 Market Street,

SAN FRANCISCO, CAL.

SEE Incorporated Mines Paying Dividends Page 10a

WM. M. COURTIS, A. M.

★ Mining and Metallurgical Engineer

Assayer and Analytical Chemist

Office: 418 Hammond Building,
Permanent Address, 449 4th Ave., Detroit, Mich.

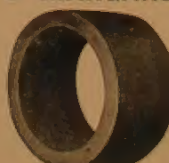
Assay Office and Ore Testing Laboratory
OF HENRY E. WOOD, Assayer

1724 ARAPAHOE ST., DENVER, COLORADO
Established in Colorado in 1876

Control and Umpire Assays a Specialty. Wildcat Concentrator in Operation. Write for circular giving prices, etc.

HADFIELD'S MANGANESE STEEL,

HARD, TOUGH.



Best Metal known for Stamp Shoes and Dies, Roll Shells, Crusher Plates and Side Liners. Toggles and Toggle Bearings, Gyratory Cones and Concaves or Liners, Mine Car Wheels, Coal Crushing Rolls, Etc., Etc.

TAYLOR IRON AND STEEL CO.,
Sole Licensees in America under Hadfield System and Patents. High Bridge, N. J., U. S. A.
All Pacific Coast parties interested please address, Parke & Lacy Co., San Francisco, Cal.

periments of Moissan, who obtained artificial diamond by dissolving carbon in molten iron and immersing the mass in cold water until a firm surface crust had formed. The "chill" mass was then removed, to allow its still molten core to solidify slowly. This it does with the development of enormous pressures, because the natural expansion of the iron on passing into the solid condition is resisted by the strong shell of "chilled" metal. The isolation of the diamond was the accomplished by dissolving the iron in acid.

BULLETIN OF KANSAS MINERAL RESOURCES.

The *Annual Bulletin of the Mineral Resources of Kansas for 1898*, by Erasmus H. Worth, Professor of the Department of Physical Geology and Mineralogy and Chief Geologist of the University Geological Survey of Kansas, contains 127 pages and 22 illustrations. The first desirable point which meets the reader's eye is good wide margins, so that the reader has room on each page for private notes, which is a commendable feature in a statistical publication. The introduction contains four pages, which are reproduced on another part of this issue. The history of the recent gold excitement in Russell, Ellis and Trogo Counties is reviewed, and the negative result of some two hundred assays and sound geological reasons given, for the hopeless prospect of finding commercial amounts of gold in the Cretaceous shales of Kansas. Lead and zinc being the chief mineral products of the State, receive extended notice. Oil and gas sources, both present and prospective, are reviewed. Gypsum, building stones, clays, hydraulic cement, with the subjects already mentioned occupy the first 66 pages, and the remainder of the work is taken up with the ancient and modern history and different processes of the manufacture of salt by M. Z. Kirk. As salt is the third most important mineral product of the State, this excellent technical and statistical review of the present status of the industry is of more than local interest, as it is of value to all salt manufacturers, and forms an object lesson which a good many states can profit by copying, how such technical reports should be made to record the industrial development of their section of the country and add value to an annual statistical report. As a rule it is not desirable to have State Geological and Statistical work done by University Staff Professors, on the principle that a man cannot serve two masters well or efficiently, but the excellent work of the University Geological Survey of Kansas is a very happy exception to that rule, as is evident from the high class and complete work produced, of which the present Bulletin forms the last issue.

FORMATION AND CONTROL OF TRUSTS.

Under this title, President Hadley has written for the November number of *Scribner's* one of the most thoughtful and philosophic articles that has yet appeared on the recent and continuing consolidation of industries. He thinks that the movement has already spent itself, so far as it is based on the desire of promoters to load up the public at fancy prices with securities of doubtful merit; but a genuine economic reform underlies the phenomenon in its essential qualities, and consolidations will go on so far as they are based on real advances in operating and distributing administration. Attempts to stop this natural

evolution of industry will be as futile in the realm of manufacture as they have been heretofore in that of transportation. Their vast powers of good or evil to the consuming public make the managers of these enormous corporations real trustees in a sense not commonly realized. The wise exercise of this trust cannot be provided for by legal enactment, but must come from a widened conception of directors' responsibility to the public as well as to stockholders. As the movement of consolidation goes on, and the semi-public functions of directors are more and more recognized and insisted upon, the difference between public and private business will diminish; and this difference is likely in time to become so slight that the question of state ownership of industrial enterprises will cease to be important.

This skeletonized statement of President Hadley's article shows the drift of his opinions. In most respects his essay is in line with the best thought on the subject. He makes a distinct departure, however, from the doctrine of many able economists in believing that the growth of consolidated business not only does not foster socialism, but actually tends to retard the nationalization of industry. His argument is forceful, and will doubtless receive much attention from students of the subject.

TRADE IN WEBER GASOLINE ENGINES.

One of the largest single orders ever given by a firm for gasoline engines was secured last month by the Weber Gasoline Engine Co., 434 Southwest Boulevard, Kansas City, Mo. The order calls for engines aggregating 450 horse power, subdivided in units of 50, 40 and 30 horse power engines. All are to operate on No. 2 F. H. distillate and are being built for the Ray Mines Ltd. in Arizona. The corporation operates large copper mines and is incorporated for two and one-half million dollars. The order given to the Weber Company will mean an outlay of \$50,000.

There are some very interesting features connected with this order and the district where the engines are to be delivered. The contract was very eagerly sought by leading manufacturers of gas and gasoline engines in the United States, England and Germany. English engine builders were especially keen after it, as the mining corporation is a strong English concern.

No. 2 distillate is perhaps the cheapest fuel known, and the engines will be operated by it at a cost of six-tenths of a cent per hour for each horse power. They will be run twenty-four hours per day. The entire number of engines must be built and in operation at the mines by April 1, 1900. The mines are located eighty miles from the railroad, but the mining company at an expense of \$15,000 has graded and made a roadway the entire distance. This will necessitate hauling the engines in wagons to the seat of future operations. The Weber Company will send a corps of machinists to set up the engines. Some idea of the mining company's operations may be formed from the fact that this array of power-producing machinery constitutes but one-half of the power plant. The remaining half will be installed within one year.

The contract expressly states the engines must be installed and in operation by April 1st, and to do this in the five months' time the Weber Company will operate its factory day and night. Another order for a 30 horse

power engine was completed and shipped Oct. 25th to the Norwegian Copper Works. This order was secured through the London agent of the Weber Company and will be operated in a corner of the world of which little is known by the great majority of the people. The shipping directions which accompanied the order may be read, but the average American will hardly dare to attempt to pronounce them. Here they are: Norwegian Copper Works Birtavarre in Kaafjord, Lyngenfjord Island of Tromso. Rand-McNally's atlas of the world places the island North of the Northern coast of Norway and near the 70th parallel. It is farther North than Ireland and almost as far North as the most Northern point of Alaska. Into this remote place a specially constructed gasoline engine bearing the name of the Weber Gas & Gasoline Engine Co., Kansas City, U. S. A., is to be operated for running the blowers for the furnaces of the Norwegian Copper Works. Another shipment will shortly be made to the Isthmus of Panama, where quite a number of Weber Engines are in successful use. To get back home again, a 50 horse power Weber Engine has just been installed by J. G. Peppard, the wholesale seed merchant, who has been using Weber Engines for the past nine years.

The Company's business is in a flourishing condition and from every quarter of the globe orders are being received.

We desire information concerning the Burdett Mining Co., which in 1865 issued stock on which Edward Pierrepont's name appeared as President. Any reader of the *JOURNAL* who can inform us whether the company is still in existence, or, if not, what disposition was made of its affairs, will confer a great favor.

William Pigot, a mining expert from Seattle passed through Los Angeles, after an inspection of the iron mines or deposits just east of San Ysidro, about 200 miles down the Lower California Coast from San Diego. These deposits are owned by A. Godbe and General Webb, and are known to be very extensive and of very high grade. Mr. Pigot represents wealthy capitalists of the Puget Sound country who may become interested in the property. His report of his investigations will undoubtedly be favorable to the property, although when seen he declined to make public any opinion on the property, saying that was reserved for the owners.

Announcement is made of the organization of the New York Air Compressor Company, under the laws of the State of New Jersey. The capital stock of the company is \$100,000, and a complete foundry and machine shop plant has been purchased on the line of the New York & Greenwood Lake Railroad, at Arlington, N. J. The New York Offices of the Company are at 120 Liberty Street. Contracts have already been let for a full modern equipment of tools.

It is intended to manufacture a complete line of air compressing machinery at this new plant.

The Officers of the Company are: J. W. Duntley, President; Alexander MacKay, Vice-President; W. P. Pressinger, Secretary and Treasurer.

The Directors are: J. W. Duntley, Alexander MacKay, W. P. Pressinger, William B. Albright, W. O. Duntley, Thomas Aldcorn and Austin E. Pressinger.

MINING IN SONORA.*

BY J. R. SOUTHWORTH.

The opening up of the riches of the State of Sonora is traveling with gigantic steps and very soon this will be one of the principal sources of wealth as the improvement in agriculture and its production and the growing development of its mines are placing it in the

vast territory is formed of a network of metaliferous veins, of deposits of coal, gold placers, and enormous veins of silver.

Minas Prietas and La Colorada are among the most prominent districts in the state.

It was toward the middle of the last century, about the year of 1743, when, according to reliable accounts, the existence of large deposits of gold in this most important region

ancient workings, the large number of arrastras, the immense dumps of tailings and the ruins of large buildings which still are to be seen at some points. Aigame and Las Placitas were known at that time as the "Real de Candelaria."

The mines being abandoned for the space of many years, the active and expert miner, Don Ricardo Johnson denounced the known group



MINAS PRIETAS

vanguard of the other states forming the Mexican Confederation.

Mining in the last few years has taken a great increment and we are now commencing to see foreign capital embarked in the development of this great industry which is one of the principal elements of life in this region. Any one who has a slight knowledge of the forward steps that mining has taken lately will understand that this industry is the one which

of Senora became known, the mines, Sierritas, Verde, Aqua and Colorada being then discovered and worked by the Jesuit missionaries who established at that time the Real Aigame, as the nearest point to water for the treatment of the ores which they took out in large quantities from said mines, until the persistent molestation of the Indians compelled them to abandon the district. Afterward, in 1790, miners from Aigame and Las

of Minas Prietas under the denominations of San Juan, Delfina, Amparo, Florencia and Creston, and for years under the protection of the house of Ortiz Bros., Hermosillo worked them with more or less good fortune, until he sold the first four locations for \$150,000 to a rich North American company, which immediately began to work them systematically, establishing large reduction works at a cost of more than \$300,000, and in a short time took



LA COLORADA

has taken the most important place, and it is also the one most susceptible to prosperity, as it brings foreign capital belonging almost always to companies and syndicates more or less wealthy; and also because of the innumerable quantity of mines being discovered daily and benefitting, all shows us that this

Placitas exploited for eight or ten years with good results the mines of Prietas, Verde, and others; but some of them becoming flooded and others abandoned, they remained at the mercy of the chloriders who many years worked them after their own fashion without greater advantage.

The importance of these mines is revealed solely by observing the magnitude of the

out many millions of dollars until 1891, when the interior works were destroyed by fire and the company, being aware that the value of the ore had decreased, was content to nominally preserve its property in said mines without undertaking any new work upon them such as was necessary to put them in paying condition. Subsequently they were purchased by the Creston-Colorada Mining Co. In 1886,

*From "Sonora Ilustrado."



GRAND CENTRAL MINING COMPANY
MEN'S QUARTERS OFFICE HOIST NEW 30-STAMP MILL TRAMWAY TO NEW SHAFT

Messrs. Chamberlain & Price bought of Mr. Johnson the Creston Mine, which may be considered as the extension of the Minas Prietas, together with the Santa Cruz and Colorado, for the sum of \$200,000.

The important mines, Amarillas, Verde, and Grand Central, also no less rich properties, belong to diverse owners in which systematic work has been undertaken and powerful machinery erected for treating their ores.

In 1896, the London Exploration Company purchased the Amarillas and Grand Central mines and consolidated their ownership into one corporation known as the Grand Central Mining Co.

There are besides new mines belonging to the Union Mining Company—seventeen in number—covering an area of four leagues in circumference, in which extensive prospecting work has been done with good results.

Blanc Julia and Fortuna, two prospecting shafts, are being opened by a Mexican company for the purpose of cutting the principal veins that cross the district from east to west in that section, and the now very important mine, La Patria, which from a simple prospect has become a rich mine with a promising future, the ores of which pay a value of \$100 per ton.

Intelligent miners, native and foreign, agree that this is one of the most important mining regions of the entire world.

The mines of the Grand Central Mining Company, (Ltd.), are at an altitude of 1700 feet above the sea level. The company was registered August 6th 1896, with a capital of £250,000 sterling or \$1,250,000, with head offices in London, England. Besides the above mentioned Amarillas and Grand Central mines, the Company owns the Negra, Violeta, Montana del Oro, South

Verde, La Verde and the Sonora, the acreage of the claims amounting to 323 acres. Surrounding the mines are a number of wood ranches covering a territory of over 200,000 acres in which the company owns interests.

The past productions of these mines have been very great, it having been estimated that the gross production has amounted in round numbers to \$2,225,000. The country rock in which the several veins of the mines named are found, is a hornblende diorite repositing upon which, where not eroded and capping the higher hills is a quartzitic rock, which close examination may prove to be a silicified porphyry. Generally accompanying the veins either on one side or the other are dykes of a rock provisionally termed quartz porphyry.

The ore is principally quartz and carries varying amounts of pyrite, Chalcoppyrite and galena. The value of the ores in gold and silver, the proportion of each metal varying greatly shows, about sixty-five per cent. of the value in gold and thirty-five per cent. of the value in silver.

The surface equipment of these mines are excellent and improvements are constantly being made.

The Creston Colorado Company was composed of the above named Gentlemen Messrs. Chamberlain & Price, but in 1892 both partners died and the property was run by the two estates until April 1895 when the present Company was formed of which E. R. Perkins, of Cleveland, Ohio, is president, the stockholders all living in Cleveland.

Work was commenced on the Colorado claim to develop it; and at the same time the construction of the Colorado mill was commenced, and the work was pushed rapidly forward to an early completion. This mill has run continuously since that time. In 1891 valuable ore was discovered in the Colorado, which was shipped to Pueblo, Colorado.

Some time in 1894 development work was



GRAND CENTRAL MINING COMPANY
NEW 30-STAMP MILL OTTO TRAMWAY OLD GRAND CENTRAL MILL NEW SHAFT SHAFT NOW IN USE

begun on the Creston and a new shaft has been sunk to a depth of 1150 feet. The hoisting works at this mine were equipped with a capacity of hoisting ore 2,500 feet, and a new tramway has been erected between the Creston mine and the Colorado mill, which has a capacity of 500 tons in twenty-four hours, the ore being transferred about three-fourths of a mile.

Connected with this company is a large roasting and cyanide plant with a capacity of 100 tons daily for treating the Creston tailings, and the cyanide plant for treating tailings of the Colorado mine.

A new shaft is now being sunk on the Colorado mine to connect with the old workings, and there is sufficient ore in the mines to rush the mill for some time to come. Sixty cords of wood are consumed daily, in making steam for motive power and to run the stamp mill with a capacity of 160 tons per day.

In conclusion we might state that the ore deposits found in this district are certainly among the richest and most productive of any in the state and perhaps in the Republic of Mexico.

GREAT COPPER REFINERY.*

The Anaconda Company's great refinery at Anaconda lies immediately below the upper works, with perhaps a short quarter of a mile between. Here it is that the copper product is subjected to the last process necessary to fit it for the market. When it leaves the refinery it is practically pure, and is the electrolytic copper of commerce.

That the reader may get the entire treatment in a general way, it may be stated that the ore is received at the works, the first step is to concentrate it by crushing and working off the poorer parts so as to reduce the quantity and raise the grade. Then these concentrates are sent to the smelter, where they are first roasted, in order to get rid of a portion of the sulphur they contain, and then melted in the matte furnaces where portions of the other impurities are worked off in slag, the product being a matte containing 50 per cent. copper.

This matte is sent to the converter, where it is melted again mainly by a combustion of the sulphur it contains and the oxygen of the

atmosphere. The iron and other metallic impurities are first drawn off in slag and then a strong current of air is turned on and the sulphur blown away in fumes. The residue is metallic copper, perhaps 98 per cent fine. This is run into large plates called anodes and sent to the refinery.

The refining is done through the agency of sulphuric acid and electricity. The establishment is provided with 1,400 refining tanks. These are filled with a solution of sulphuric acid. From crossbars thin strips of copper are hung. These are called cathodes, because they act as the negative pole of the current. In the same tank, alternating with the cathodes, are hung the anode or positive plates from the converter, the distance between them being but a few inches—about six. A current of electricity is turned on passing first through the anodes and thence through the solution to the cathodes. The sulphuric acid unites with the copper of the anodes, forming a sulphate of copper in solution; then the current of electricity carries the copper over to the cathode strips, where it is deposited practically pure, the gold, silver and anything else contained, being precipitated to the bottom of the tanks and the values separately saved.

This plant is the largest of the kind in the world. It is divided into two parts known as the old and the new. The old part contains 600 tanks and the new portion 800. In the old part the machinery is more primitively than that of the new. When a tank load is ready to come out it is hoisted, all the plates at once by two men with a hand tackle. The anode plates immersed in a single tank weigh from 6000 to 7000 pounds. In the refining process they are reduced to about 800 or 1000 lbs., about 5,500 lbs. upon an average having been carried over to the cathodes. This requires about 25 days.

The new portion, which is 250 feet by 300, is equipped with



LAS PRIETAS MILL, CRESTON COLORADO COMPANY

three immense traveling cranes, two being each 80 feet in length and one 90 feet. These move the entire length of the building over the tanks carrying the anode plates to the tanks in which they are to be placed for refining, and taking out the refined cathodes when ready. The capacity of the refinery is about 125 tons of refined copper daily, and it is now being run nearly up to that figure. In the refinery proper there are about 100 men employed.

This great refinery has what may be justly termed the finest engine and boiler plant in the state of Montana. The engines grouped in one fine room are five in number. The largest is what is known as a Harris-Corliss. It is of 1,000 horse-power, with a combination fly and belt wheel 20 feet in diameter with a eight-foot face upon which the belting travels. As a rule this great engine runs steadily, but it is now temporarily stopped while a new and separate steam connection is being made. There are also two 900-horse-power triple expansion Union Iron Works engines and three Westinghouse engines, each of 450 horse-power, making a total of about 4,130 horse-power.

In the same great department are nine dynamos, of which seven are in regular use, with two held in reserve. It is estimated that the machinery in this single room has cost more than a quarter of a million dollars.

The boiler plant is on the same magnificent scale. It consists of ten sets of Heine water tube boilers and four sets of Elephant boilers from the Union Iron works of San Francisco, Cal. These range from 250 to 350 horse-power to the set, the total being in the neighborhood of 4,000 horse-power, making it also the greatest boiler plant in the state of Montana.

The four sets of Elephant boilers have a separate iron stack for each set, but the ten Heines are all connected by flue with the great brick stack outside the building. This stack is about twenty feet square at the base, rising to a height of 130 feet from the ground, and brought to a circle at a height of about thirty feet from the ground. A new auxiliary eight-inch steam pipe connects the large engine direct with the boilers. These works are under the superintendency of F. Wilkinson.



CRESTON HOIST AND ORE BINS, CRESTON-COLORADO COMPANY

*From "Anaconda Standard."

MINERAL RESOURCES OF KANSAS.*

BY PROF. BRAMMUS HAWORTH

The year 1898 was an unusually prosperous year for almost all mining enterprises within the State. The output of zinc ore was the greatest in value ever known in the State. The output of lead ore fell far short of that of preceding years. But the continued value of the two was greater than that of any other year in the history of lead and zinc mining in Kansas. The zinc smelting business was unusually successful, due principally to the extended application of natural gas as a fuel in smelting; but the amount of spelter produced for 1898, great as it was, is much smaller than that which will probably be produced during 1899, as a number of smelting establishments began operations early in 1899.

During the year the two lead smelting furnaces at Galena were in successful operation more than half the time, so that we again have our Kansas lead ore principally smelted in Kansas territory. This is the first time that such has been accomplished for a long period of years, and is therefore exceedingly gratifying to all our public spirited citizens.

The operations of the Argentine Smelting and Refining Company were very successful throughout the year, particularly in their gold refining department, where the business transacted exceeded five million dollars. There was considerable decrease in the amount of silver refined. The copper and zinc produced at the refinery were entirely changed into blue vitriol and white vitriol, instead of being marketed in the metallic form. In 1897 the lead at this factory was likewise largely changed into litharge, but in 1898 no litharge was manufactured.

There was great activity in the coal industry during 1898. The total output of Kansas mines aggregated 3,860,405 tons; over half a million tons in excess of the output of 1894, which year had the next heaviest production. The price of coal, however, was but little more than in previous years, aver-

aging for the entire state and for all kinds of coal a value at the mines of \$1.08½ per ton, giving a total value of considerably over \$4,000,000, which is larger than the aggregate value of any preceding year excepting 1894, when coal had an average value of \$1.35 per ton. An interesting feature of the coal mining, however, was that there has been a general decrease of production in all localities outside of Cherokee and Crawford Counties, with a correspondingly great increase in these two Counties.

The oil refinery at Neodesha consumed the total output of petroleum for the year. There is such a relation between the refining company and the Forest Oil Company (the principal producing company) that no more oil is produced than the refinery wishes to handle. The production was considerably greater than that of the preceding year, but probably not nearly so great as it could have been made had the refinery demanded more.

The production of natural gas during the year was much greater than that of any preceding year, due principally to the large demand for it as fuel in zinc smelting. The zinc smelters use it without measuring the amount they consume, and it is therefore difficult to make a reliable estimate of the value of the gas thus produced. That consumed by the smelters was estimated upon the amount of spelter produced at the gas furnaces, by allowing three and one-half tons of coal slack to the ton of ore, and using the value for the slack as given in the coal mining district. There may be serious objections to this mode of estimating the value, but it is the best method known.

The output of salt reached over 1,800,000 barrels, which is considerably larger than that produced during the preceding year, the nearest approach to these figures being in 1892. The value of the salt is unprecedentedly low, averaging for the year twenty-seven cents per barrel, making an aggregate value of nearly half a million dollars. To this sum the coöperation should be added, to express the correct idea of the magnitude of the salt industry. With a coöperation of twenty-five cents per barrel, the salt industry reached a

total of nearly a million dollars. It is a curious fact that the value of the salt in the barrel was but two cents greater than the value of the barrel.

The gypsum and gypsum-cement industry was not as active during the year 1898 as in preceding years, neither was the value per ton as great. The Acme Cement Company has withdrawn from the State. Other plants were in general less active than in preceding years. The new mills at Mulvane, now in successful operation, were not completed until about the first of January, 1899, so that their output does not affect the returns for 1898.

The hydraulic-cement industry is still confined entirely to Fort Scott, where the two factories did a business about the same as in 1897, producing 160,000 barrels, with an average value of thirty-eight cents per barrel.

It is difficult, almost impossible, to gather reliable figures on the stone industry of the State. The large stone companies respond very promptly in general to letters of inquiry regarding their output. But there are so many small quarries here and there over the state, the locations of which are not known to the writer, quarries which individually are of little importance, but which collectively amount to a great deal, that the total sum of the stone industry as given is, after all, a mere estimate. The writer would esteem it a great favor if every quarryman in the State, who may chance to read this article, would send him his name and address, so that a correct directory of the stone quarries of the State may be compiled.

The year just past has been a prosperous one for the manufacturers of the various kinds of clay goods, particularly for the brick factories. The total product reached an aggregate value of nearly \$400,000, which is far above that of any other year. The greatest increase was in that of vitrified brick, which are now used extensively in street paving, the second greatest increase being in common building brick. With the increased demand for various kinds of building material already manifested for the year 1899, one may confidently expect that the brick industry in a short time will reach a magnitude very gratifying to all our citizens.

ELECTRIC TRANSMISSION AND ELECTRIC DRILLS FOR MINES.*

BY F. HILLE, M. E., PORT ARTHUR, ONT.

When we see that in the neighborhood of a number of our mines the fuel supply for motive power is, or is nearing to become, a question of grave concern, and that this is heightened through the burning off of valuable timber by careless and unwise men, or through accidental igniting of the dry brush by the sparks of the locomotives, or even through lightning in the course of thunderstorms, then we are very vividly reminded to look for another medium that can drive the apparatus in our mines. Now, what can impress itself more quickly on us than the numerous falls of our creeks and rivers, whose roaring and thundering have become to many of us, who roved around this country so often, a familiar music, and which has lulled us many a bright night into the arms of Morpheus. How often has that little dream god shown us these wild rushing waters harnessed into useful occupations, and how long will it be ere these dreams materialize and we shall

*Paper read before the Canadian Mining Institute September, 1899.

TABLE SHOWING VALUE OF EACH OF THE PRODUCTS OF KANSAS FOR 1898 AND SINCE INDUSTRY BEGAN.

PRODUCTS	VALUES FOR 1898	TOTALS BY DIVISIONS FOR 1898	GRAND TOTAL OF PRODUCTION
<i>Non-Metallic Products.</i>			
Coal.....	\$ 4,193,159.70		\$ 55,085,641.41
Salt.....	489,454.23		4,778,655.17
Clay Goods.....	390,630.00		1,820,934.00
Gypsum.....	129,652.00		1,810,059.00
Stone { Limestone.....	180,000.00		3,087,226.00
Sandstone.....	25,000.00		675,972.00
Natural Gas.....	188,846.00		792,246.00
Oil Refined.....	176,000.00		358,504.93
Hydraulic Cement.....	60,800.00		661,466.00
Lime, (estimated).....	65,000.00		1,315,000.00
Sand, (estimated).....	50,000.00		400,000.00
<i>Metallic Products.</i>		\$ 5,948,541.69	
Zinc Ore, \$1,994,230, yielding metallic Zinc.....	\$ 3,622,768.68		\$ 39,286,227.52
Lead Ore, \$352,798.45, yielding metallic lead.....	463,464.84		
		4,286,227.52	
<i>Smelting Products.</i>		\$ 10,226,669.21	
Zinc Smelting.....	\$ 3,648,715.57		\$ 29,668,342.03
Lead Smelting.....	170,227.01		170,227.01
Argentine Smelter.....	12,920,810.97		127,401,938.67
Total Output.....		\$ 16,739,803.55	
TOTALS.....		\$ 26,966,472.76	\$ 267,247,358.08

*From Annual Bulletin of the University Geological Survey of Kansas.

have every one of these at present useless spending powers utilized for the benefit of one or another of our industries? But before I proceed with this subject I take this opportunity of warning our people of this vandalic destruction of the forest by fire, or we shall experience the consequences, that in a few years most of the little creeks and rivers, and with them the lakes, large and small, will dry up, and we will be deprived of the present very convenient way of travel, and the cheap medium for power. One who has known this country for years has seen with regret the diminishing, and disappearing of many of our watercourses. Even Lake Superior is lower by nearly twenty-four inches since I first knew it, and this is principally caused by the burning off of the forest.

I mentioned above that we have numerous falls in our country from which we could derive motive power, and I do not exaggerate when I say that I know of nearly a hundred in the districts of Rainy River and Thunder Bay, some of considerable size and beauty. Many of them are right in our gold mining region, others in close proximity, and others again further off, but many so conveniently situated that they would not cause a great outlay of capital in transmitting the electricity profitably to the mines. We all know that distance is nowadays no great obstacle since improved machines and a better insulation are at our disposal. Even as early as 1891, at the time of the Frankfort electric exhibition, the first long-distance power transmission of 110 miles in length proved a success, for the loss was only 26 per cent, although different pressures from 65 to 28,000 volts were tried; and now we talk of distances of 500 miles and losses of only 10 to 15 per cent. Distance has to be considered only, then, when the consumption of power in a mine is small and is within easy reach of cheap communication. The question will arise then if it would not be more economical and convenient to use a different motive power, produced either with gasoline, or better yet, refined or crude petroleum, for instance with a Diesel motor.

The advantages of long-distance transmissions are specially noticeable when high voltages are transmitted for large industrial centers, or for distribution of power among a greater number of mines, situated in close proximity, or for a mine far off from the sources of fuel. But as I said above, it is very questionable if it will be always advantageous for a single mine to go to the great expense of establishing water power and transmitting it from afar to the workings. This has to be determined in every instance by closely figuring all the different conditions. We have, therefore, to consider transmission for greater distances, and such for electricity generated at the time.

Now let us suppose, for instance, that we needed a large amount of horsepower for different machines, and wish to sell our surplus power to others, and know we can get this power from a rather distant waterfall. We take also for granted that utilization of this fall and the establishing of the primary motor—here the turbine or any other water wheel—causes no difficulty whatever; therefore the next thing to be taken into account would be the dynamo, that is, has it to be a direct current or an alternating current machine? Now we know we need a greater number of horsepower, the distance is not inconsiderable, and we wish the current to do different work. In this case the only acceptable machine for us would be the alternating dynamo, because the

direct current machine has a limited transmission of only about 2,000 volts, and this current cannot be divided in the manner we wish. This is different with the polyphase current, which can easily be transformed into direct current of any strength which we might desire, or changed into as many motors as its pressure will permit. I come now to the second question—the production of electricity by some other medium than water and directly at the mine. The building of dams, the laying of pipes, and the erecting of a power-house with all its machinery and other installations near a waterfall for the transmission of electricity over a long, costly wire, is rather an expensive thing, and not every owner is in the fortunate position to indulge in such expensive enterprises. We conclude, therefore, to buy a gas or petroleum motor, which offers the most convenient and economic way to solve that problem. Also in this case, the dynamo is a polyphase current machine, is coupled directly to the primary motor, and the generated electricity transmitted to the transformer and thence to the electric motors driving the various machines.

This mode of generating electricity will prove in many instances more advantageous and economic than the first system, for what we spend more in petroleum to run the motor we save again in wages for attending to the different machines and line of wire, and also on interest of capital expended, and not less so on loss of time in repairing, in telephoning from the mine to the power house at the falls, and I have a right to mention it, a saving of power in the shorter transmission. These are considerations of much importance, which will, I have no doubt, decide in many instances the choice between the two systems of primary power, especially in places where railroad or water communications are near at hand and the freights reasonable.

A mine which is in the fortunate position of having electricity as motive power should make use of its advantage and drive with electric motors every one of its machines or works. The great convenience which accrues out of such an installation is obvious when we consider the difficulty which we experience often in transmitting the power of the steam boilers and engines, be it steam, air or rope transmission, to our various mine workings. I might mention, however, that machines which need more than 50 horse power would be better driven by a generator of their own, because the switching in and out of large motors would cause inconvenient differences of pressure in the main line, and affect the other motors to some extent. What advantage it is, but especially in large works, to disconnect or switch out any machine or apparatus at any moment without being obliged to shift belts over loose or friction pulleys, nor being able to stop the humming or buzzing noise of the overhead shafting with its tangle of belts, which are a constant menace to everyone's dear existence, not to speak of the great convenience to convey the power with ease from place to place and from any machine above or below ground to another!

Now, I wish to direct your attention to one of these machines which has, strange to say, found in this country very little or no attention, although it deserves it very fully. It is this, an electric drill of a very ingenious but simple construction and of great efficiency. The reason that we have heard and read but little of it in this country, and even in the States, is that we are too indifferent in acquainting ourselves with what other an-

tions do in the various industries, and this is especially the case in the mining industry. We patronize in many cases the home industry too much to the disadvantage of our miners and mines. To some extent it might also be attributed to the prejudices which seem to exist against electric drills on account of the poor success which the so-called solenoid machines had. These machines were constructed after Werner Von Siemens' so-called electric hammer principle, but soon abandoned by the latter. The principal faults of these machines were their inefficiency and weak return pull of the bit, although the consumption of energy was large, too large compared with the newer drills of Siemens & Halske. But even that earlier machine is surpassed in waste of power by the air drills so much in vogue at the present time. These earlier machines had the solenoids—the motor—in the drill itself, which was a great disadvantage, considering the shocks which they receive with every stroke of the piston; besides, it soon became hot, and lost on account of this a large amount of energy, that is, efficiency. Different is it with the newer percussion drill of Siemens & Halske. The motor is here separated from the drill, and is connected with it by a flexible shaft of about 8 ft. long. This arrangement enabled the inventors to construct a more compact solid machine, but at the same time a more simple mechanism. The axis of the piston could be placed near the one with which it is fastened to the upright or tripod, therefore a more rigid position was secured, and a shaking when in operation was avoided. But to give the drill a still more steady working a fly-wheel was fastened on the crank shaft of the machine whose inertia would hinder the power-transmitting mechanism, especially the teeth of the cog-wheels, from clattering upon each other. Another good arrangement is connected with the machine—the piston rod for the drill steel is hollow throughout, therefore it is not necessary to change the position of the machine when a new bit has to be inserted. It can be done from the hind end by releasing the key with which it is fastened in its place. Further, the feed of the steel is on these machines, either by hand or automatic, but always self-regulating according to the hardness of the material to be drilled. A jamming of the bit in the hole, which is with most percussion drills a very common occurrence, happens very rarely, for the return pull of the piston is so strong that on account of this and the powerful concussion the columns or stretcher bars had to be constructed especially strong, and instead of the common tripod, a quadripod, if you will permit me to give the four-legged stand that name, had to be provided for this percussion drill.

In regard to the consumption of power, this machine excels in economy every other percussion drill so far invented or in the market. A drill working with full capacity will use from 0.8 to 1.3 kilowatts, or six drills in operation will need ten horse power of a steam or water engine, if the length of the transmission of power is not too great, and 12 horse power if it is great. It will drill a hole in the hardest rock from $1\frac{1}{4}$ to $1\frac{1}{2}$ ins. wide and from 2 ins. to 12 ins. deep in one minute; for instance, in very hard granite 3 ins. to 4 ins. deep per minute. There is not one percussion cap, steam or air driven, which could show such results combined with such economy. To make a comparison, only the largest size of air drill might be able to drill a hole of the same depth and in the same time

above mentioned, but would need six to eight times the power of one of the smaller electric drills. The vertical depth drilled with this machine is $6\frac{3}{4}$ feet, and the depth bored without changing bits is 16 ins., with about 420 strokes per minute. The weight of the machine is about 240 pounds, and to raise and lower it on the stretcher bars with ease a small block and tackle is used.

Besides the percussion drill the firm of Siemens & Halske manufacture also a "rotary drill." This machine, which is used for boring in rocks and fossils of a softer nature, is of simpler construction and lighter weight than the former. No fly-wheel is necessary for this drill, because the drill barrel has only to follow the rotation of the flexible shaft and the forward feed of the inner mechanism, which is automatic and self-regulating according to the hardness of the metal to be drilled. The consumption of energy is with this machine as with the former, about 806 watts = to 1 hp., and will bore in rock salt a hole 9.1 ins. wide by 12 to 16 ins. deep, or in salt, clay, gypsum or oolitic iron ore, etc., 8 to 10 ins. per minute. With two bit changes the machine can bore a hole over 6 ft. Its weight is not more than 70 lbs., and breakage or parts showing wear or tear can be easily and quickly replaced by new ones. The construction of the stretcher bar or column can be said to be a very handy apparatus.

I have to say now a few words about the flexible shaft which connects the drill with the motor. This shaft consists of two parts; the outer protecting flexible tube is made of a steel wire spiral and surrounded with leather; while the inner, the real power-transmitting part, is a very pliable apparatus made of a number of right and left wound conaxial steel wire spirals, provided on both ends with massive steel pins and couplings, with which they rest smoothly against the outer protecting tube, and connect firmly with the motor and machine. The whole shaft is very solidly made, so that a rough handling in the workings will not injure it very easily.

Now, when we consider with what ease all the different parts connected with these drills can be carried from place to place, and compare it with the work that is necessary and the difficulty which exists in carrying the air or steam along in a mine, we understand readily the saving of time, and also the saving of expenses, especially when we compare the much greater efficiency of these electric drills with those of steam or air.

CORRESPONDENCE

ARIZONA.

(From our Special Correspondent.)

CHLORIDE, ARIZ., Nov. 24, '99

At last, after months of toilsome developments, the Midnight Mine is mentioned among the big paying and producing mines of the district and Mohave County. The present developments were begun last April, under a bond and lease, a contract for the sinking of a 200-foot shaft, and the driving of two drifts north and south for 100 feet each.

Several streaks of very rich gold quartz were passed through in sinking the shaft, but it was not until the north drift was driven half its distance that the present large and rich ore body was cut. The ore carries both gold and silver, the former predominating.

Development work on the Midnight and its present results have been watched with much eagerness by the local public, as it was known that it would make the fifth large paying mine in the camp, and very materially add to the existing force of miners.

The work of getting the new 100 ton concentrator in place at the Merrimac Mine is progressing nicely, and the dump is well stocked with ore awaiting its completion. Work in the drifts, from the 400 foot level of the main shaft is being done with day and night forces, and the ore bodies continue full and well rounded out. In one drift from the 400 level, the ore measures eight feet in thickness, and the drift is being driven through it without any sign of waste on any side. The two other drifts are also in good bodies of high grade ore, but not nearly so large as the first. The mine and new mill are now employing sixty-five men.

The Tennessee Mine is now in the largest and richest body of ore it has ever been the good fortune of that great property to be in. Streaks and nuggets of pure silver cross and recross the whole body of twelve foot ore, and much of it will mill many thousand ounces to the ton. Additional facilities have recently been made for the reduction of ore, but yet the present capacity for concentrating is almost wholly inadequate to the supply. Water now, and for sometime past, has been plentiful, and the mill has been kept going night and day for about ten weeks, something like 200 tons of ore being put through every twenty-four hours.

The new miners' exchange building here has put its walls up and the roofing mostly on. The building is 36x50 feet in size, and one story high and composed of adobes. The shelving and counters for the retaining of ores will be quite elaborate, and will show off the rich specimens of ore they will contain to great advantage. It is expected to keep on exhibition ores from all parts of the county; no camp, no matter how small, but is expected to contribute its quota of specimens of gold, silver and copper. Maj. Mesch has been succeeded by Mr. A. M. MacDuffee as secretary of the exchange and display of ores, who will always be found at his post, ready and willing to give visitors a cordial reception, and impart the information they desire about the mines and ores of Mohave County.

CALIFORNIA.

The Manvel Gold Fields.

(From Our Special Correspondent.)

MANVEL, Cal., Nov. 23, 1899.

EDITOR JOURNAL:—In continuation of my investigations, as published in the JOURNAL of October 1, 1899, I have obtained additional facts as follows:

This new gold-producing field lies on the Eastern slopes of the New York Peak of the Providence Mountains. This peak is about five miles distant from Manvel Station on the California Eastern Railroad. The field is therefore about five miles square, so far as known yet, but these same ores, it is believed, will yet be found further North and South. At present the prospecting is confined to the area named. This makes the old New York mines the South, and Vanderbilt the North limits of prospecting. In this field, along the base of the highest mountains, occurs the quartz, feldspars, veins, bulges or blowouts, in which is the quartz, with the base ores of gold, mostly, as sulpho-tellurides, and in the

accompanying feldspars the gold is combined with the metals aluminum and iron double base, and does not pan. The whole region is not a panning or horning proposition, and this accounts for its being passed over by prospectors and locators heretofore. The lower park or flat field of old white or grey granite, in which are an abundance of small black hornblende crystals, has been by volcanic action ripped and torn very much, generally East to West or Southeast to Northwest, or vice versa. In these rents occurs the gold ores, as intrusive or volcanic veins, with many bulging or strong chutes of ore coming through to the surface, exposing much ore. Opening of these mines discloses ore chutes, a quartz body in long chutes filled with sulpho telluride, pyrites and occasionally some free gold. These rich quartz chutes blend away in either direction into the quartz feldspar that fills most of the veins. Many of these veins are three-quarters of a mile long. And there are many of the veins that put off laterals that connect with the side or parallel veins. In this respect I see that there are indications that deep work in the granite field and drifting is liable to cut many veins that do not or have not come through to the surface. That a vast field, new, of gold ore has been discovered is true. It is not all located as yet, but there have been located many claims, and considerable exploration work has been done in the past two months, and quite a number of mill test samples were made, these weighing from five to thirty pounds. The values shown thereby is given below. (No tin reported.)

Claims	high	average	low
Old Shoes quartz	\$47.64 trace	\$47.64	
	29.30	30.12	29.60
Full Moon	4.40	15	4.55
Polka Dot	5.52	trace	5.52
Homeward Bound	21.70	\$1.42	23.12

Near the summit of the North end of New York Peak is found the Homeward Bound claim and group of locations. Here I found the ores as sulphides assays having shown iron, lead, silver, copper, and greatest values in gold. On the Homeward Bound claim a tunnel has been recently run in on ore, 300 feet long. There is a crosscut all in ore of 20 feet. The tunnel has gained a depth of about 200 feet, the last 60 feet being in solid ore. In the face of the drift six feet of ore is showing, and the remainder of the 20 feet is a low grade ore body. A strip of porphyry lies with the ore. This claim is located on a contact of marbleized calcium, or lime, and granite. Six hundred feet depth will be obtained by this tunnel, and on the West slope of the mountain one can be run in that will give 1000 feet depth. There are about fifty tons of assorted ore on the dump, and a dump full of low grade ore. The mine is making about 150 gallons of water per hour. Five men are employed. There is an abundance of pine timber for the mine. The road is one-half mile away and will be brought to within 200 yards of the mine. On examination of the assays of this mine's ore, I find all shows values; about \$5 per ton is low; the average gold value is \$10 per ton; the high values were gold two oz., silver fourteen oz., lead five per cent.

About Southwest of the Homeward Bound Mines lie the Mineral King and Queen Mines, new discoveries. A crew of men are at work on a fine grade of ore showing copper, gold and silver, with a ledge about twenty five feet in width, maybe more. These men are driv-

ing a tunnel on ore into the mountain, and for every foot driven they gain about $1\frac{1}{2}$ feet. There is plenty of water and wood. The road is one mile below them yet, but can and will be built to the mines.

The Sherman mine, a carbonate of lead rich in silver, is now being worked. The mine is located in the North field, North of the Keystone Canyon.

This Keystone Canyon drains the eastern slope of the abrupt and high New York Peak. The canyon ceases below the Sherman Mine, and spreads out into a park of several thousand acres of old grey or white granite, full of veins of quartz and feldspar ores. The rim of this park is nearly circular open on the Southeast side, through which the great stone drifts and flood waters find their way to the plains below, surface verdure wasted away. The really new gold field, as strictly a gold ore, is within the rim of this park. It should be called New York Park, and the pass north of it, Manvel Pass, on the south side of it, over the mountain is the Canyon of New York and the old New York Mines. These properties as groups are reopened with a force of ten men, taking out and shipping ore, showing gold, silver, lead and some copper. It is high grade, from \$80 to \$180 per ton reported. Here is water, and it is five miles west of south of Manvel, and probably two miles to the Homeward Bound Mines, that lie to the Northwest on the Peak.

I find in here a vast field not exploited, prospected or opened, and mineral indications, float, everywhere I go, indices of gold ore. In this New York Park, is that ore which falls under an exclusive gold ore. The veins run into and over the erupted rim of the park, and, on examination, I find this erupted rim is volcanic rocks, which here folded upwards, and some tilted over, great depths or thickness of these fields of grey or white granite, with black hornblende crystals. These folds or foldings, cracked and filled thousands of rents or fissures from below. This infilling matter all shows and gives nearly a clear gold button every assay. It is strictly a gold field and ore, these ores, some free and mostly a sulpho-telluride. The center of this park is nearly level, with gradual slope to the East and Southeast, and looks like, as it is on the surface, old granites. But the rims have got the right matrix and the gold in them. I predict here, as at Cripple Creek, that, on exploration and depth, tellurides and chloritic minerals will be encountered, very rich in gold. These evidences are already found in the workings of the Old Shoes Mine. About six tons of these gold ores are on the dump when the assessment exploitation was made, a ten-foot shaft, a rim of at least thirty-six inches of quartz, filled with sulpho-tellurides. This ore looks like it had in it the metal Tin, so do many of these quartz feldspar mines. I understand assays are being now made to determine the tin and platinum values.

The New York Park gold field only wants exploration and some deep shafts, as at Cripple Creek, to make it a hummer as to shipments to the smelters and leaching plants.

Horners and panners keep away from this new gold field. The ores will not pan or horn at all. But every time that the ores are subjected to the fire assay, made by competent assayers, shows a big button of nearly pure gold, just as it did at Cripple Creek.

In the centres of these ores, I have found groups of infinitesimal balls of gold, just as the gold looks and acts on cupel when tellurium was in the ore when assayed. It is

but three miles to the railroad station, and freights to the smelters on ore are very reasonable, and the grade of ore will pay to mine, ship and smelt. The California and Eastern Railroad Company has a survey for railroad extension to the field and on up to the New York Mines at $4\frac{1}{2}$ per cent grade, 4 from Manvel. Six miles of road-bed to cost about \$3,000 per mile.

The thing to do is to get funds, and come with an outfit to sink at least 200 feet, drift and crosscut, then mine and ship ore. Come prepared so to do, or stay away, if you want to make money at mining of ore. Infillers or miners can make some money, of course.

GILES OTIS PARCER, M. E.

UTAH.

SALT LAKE CITY, UTAH, Nov. 25, 1899.

EDITOR JOURNAL:—Chloride Point did considerable business this week at reduced figures. It should be a good investment at present prices, as energetic prospecting for ore is going on.

Daly was somewhat stronger near the close of the week. Daly West dropped off a little for no particular reason. Dalton & Lark was more active this week and should sell at better figures before long, as there has been some good ore uncovered in the lower levels. Daisy was much lower this week, although a great deal of stock changed hands. The decline was on the report of an assessment being levied to pay off the indebtedness, which was not confirmed up to the present writing. Dexter has done considerable business this week at higher figures. Good reports have been received from the mine.

Four Aces was weak, selling below 10 cents. Geyser-Marion inactive. Grand Central was somewhat lower with very little business done. It is reported that they will pass their December dividend. Galena was dull. Horn Silver is improving. Ingot was very active this week at lower figures. Nothing of importance heard from the mine.

Joe Bowers did some business this week at former prices. Stock seems to be held very strongly. Joe Bowers Extension—considerable stock changed hands at lower figures. All the old officers were re-elected at the recent stockholders' meeting. Disagreement seems to have been practically settled and energetic work is expected from now on.

Le Reine is looking much better. The recent strike of copper and silver ore has widened out, and the character of ore has improved greatly. Prices are the same, but no stock is being offered. Lower Mammoth was a little stronger in the fore part of the week, but declined a little towards the close. There have been no new developments reported this week.

Mammoth was somewhat dull and sold lower. Mercur was quiet. There is very little stock coming out. Northern Light did some business at lower figures. Large shipments expected have not yet arrived. Reported strike of the past month has not been verified. Ontario was quiet.

Overland's Boston stockholders have been here the last week with reference to the increasing of the plant. They expect to be able to handle 500 tons per day after the enlargement of the same. Petro did some business at little better figures. Dividends have been discontinued until the opening up of the roads in the spring.

Swansea was somewhat stronger. South

Swansea was quite active during the week. They made a shipment of several cars of high grade ore. Sacramento very active and much stronger. There have been a good many Eastern orders in for the stock of late. Star Consolidated did some business at lower figures. Silver King is quiet. Sunbeam was much stronger and did considerable business this week.

Tetro is inactive. Yankee Consolidated did considerable business during the week, but closed weaker. Valeo stronger. Reports from the mines are that the ore extracted is higher grade and better prices expected.

P. J. CONWAY

Miscellaneous Mining News.

ALASKA,

A new district is being opened at Cape York, 120 miles from Cape Nome. It is reported only second in importance to the latter district, with rich beach diggings, good pay on the numerous creeks flowing into the ocean, and with the further advantage of a good harbor and safe anchorage. There are 200 miners in the camp at present, all well housed and provisioned for a year. They anticipate being able to commence work by the middle of May or the first of June.

ARIZONA.

The Morenci Copper Company has commenced operations on its property a short distance from Morenci, says the *Clifton Copper Era*. The timber for the shaft, which is 125 feet deep, was ordered some time ago, and as soon as it arrives work will be commenced at once to timber. The property of the Morenci Copper Company embraces four claims, among them being the Micawber Mine, which has now a large amount of ore on the dumps, and is one of the most valuable properties in this district. The average of 20 samples taken from the surface to the bottom of the shaft gave a value of \$14.50 gold, 14 ounces silver and 6 per cent copper per ton. Eighteen tons shipped to the Silver City Reduction Works gave a value of \$12 gold, 11 ounces silver and $9\frac{1}{2}$ per cent copper per ton. Two average samples taken from the dumps gave respectively \$8 gold, six ounces silver and 5 per cent copper, and \$16 gold, three ounces silver and 2 per cent copper per ton. The vein has been crosscut at the depth of 50 feet. A sample taken from the entire width assayed \$14.75 gold, $2\frac{1}{2}$ ounces silver and $2\frac{1}{4}$ per cent copper per ton.

CALIFORNIA.

AMADOR COUNTY.

The grading of the sixty-stamp mill at the Oneida mine near Jackson is practically completed, and barring unlooked-for delays, the mill will be finished by July next. Enough gold-bearing rock is already on the dump to keep the mill going for at least thirty days.

The new shaft is down 2012 feet, and may be put down seventy feet deeper by the time the mill is ready for operation. Should there be any unusual delay in the construction of the mill the shaft may be sunk two or three levels deeper. The old shaft is being cleaned out and repaired, 360 feet of which is already in good condition. Last week a 6500-pound

pump was placed in the old shaft, and is now in operation. Everything that is being done in and about this extensive plant is first-class in every particular.

BUTTE COUNTY.

The Lost Treasure Mine, near Inskip, was the scene of a big clean-up a short time ago. This is the pocket ledge about 19 inches wide and is owned by Mr. A. D. Larzelere. In one day early in the present month Mr. Larzelere panned out about \$500 besides securing many rich specimens of quartz, showing free gold to the estimated value of \$50.

CALAVRAS COUNTY.

The Morgan Mine, four miles south of Angels Camp on Carson Hill, has been one of the richest mines in California, and is believed to be so still, but it has been closed by litigation since 1850. The chief contestants are William Irvine and the estate of the late Senator James G. Fair. An idea of the magnitude of this legal battle may be gained by the fact that Mr. Irvine had at one time no less than 45 suits pending for this property. There is no quartz mine in the State that has yielded so much gold at about 100 feet. Up to the time of the discovery of this mine the pioneers had no knowledge of gold in quartz, and had no idea of quartz mining. When they saw the immense quantities of gold taken from the quartz they were astounded. One piece of native gold was taken out weighing \$44,000, and within 20 feet of that spot \$4,000,000 was taken out.

EL DORADO COUNTY.

Attorney J. P. Snyder, acting for the creditors of the Greek Mine Company, brought an action against that Company and others to foreclose a mortgage of \$4000 given by the corporation to John J. Snyder, now deceased, in trust for the creditors of the Company and as security for the payment of their claims. The properties covered by the mortgage are the various mines and other property owned by said Company, near El Dorado in El Dorado County. The amount of claim aggregate about \$4000.

INYO COUNTY.

News from Inyo County is that Los Angeles parties, represented by H. H. Douglas, have secured a bond on the Reward Mine and Mill, situated about ten miles Southwest of Independence, and one mile from the Carson and Colorado Railway. There are about 10,000 tons of tailings at the mines, which are now being worked with satisfactory results.

KERN COUNTY.

The Kinyon mill near Randsburg has at last been started again. They have recently made a contract with the water company which runs until March next, at one-fifth of a cent per gallon.

The deal on the Big Butte near Randsburg is off, Captain Collins declining to take the property. It is understood that the uncertainty in regard to water had much to do with the failure of the transaction.

It is reported that a Colorado company has purchased several claims over near the coal mines paying \$8000 cash for them. The claims are on the south slope of Black mountain and about four miles west of the coal mines, near which the town of Garlock was formerly situated. Mr. M. L. Wicks of Los Angeles engineered the deal.

LOS ANGELES COUNTY.

A new Company, termed the Little Georgin Mining Company, has been incorporated in Los Angeles, and with Los Angeles capital. The purpose of the Company is to develop some mining claims in the northeastern portion of Los Angeles County and on the Colorado river, in San Bernardino County.

MONO COUNTY.

The Arnot Par Value mines in Mono County have been turning out good ore and the little mill has been kept running day and night preparatory to closing down when winter gets a hold at its altitude, the Company not being prepared with comfortable quarters for a heavy winter. A large number of extensions have been taken up by Superintendent Glines, John Hays and Frank Page, Mr. Glines having a half interest in seven locations, and the others being about the same, the entire ledge being seemingly as good as the original locations, the Arnot and Par Value.

PLACER COUNTY.

A car and shipment of iron for track has arrived at Blue Canyon for the Golden West quartz mine, where development work will soon commence. The mine is located on the North Fork of the American River, near Blue Canyon, and is the property of Reuben H. Lloyd of San Francisco. The mine has a total of about 700 feet of tunnels on the ledge. A new tunnel will be started 200 feet lower than the old tunnel and at a point 32 feet above high water mark. J. B. Knapp of Blue Canyon will superintend the development work.

The leasers of a portion of the Mayflower channel have just opened up a quantity of gravel that looks very promising. Superintendent George McAulay is getting things in readiness to work the old McCall pit, owned by the Mayflower Company, by the hydraulic process. A permit has been granted by the United States Debris Commission. The company has ten men engaged in the work of cleaning the ditch, repairing the reservoir and laying pipe. A contract to build a dam has been let to Kaiser & Ralston of Forest Hill.

RIVERSIDE COUNTY.

The Hillside Mine, situated Southwest of Perris, promises to become a bonanza. O. E. Reynolds and R. S. Waller are the owners. The shaft is down 120 feet and some very rich ore has been struck. On the dump there are about thirty tons of gold-bearing ore, and as none has as yet been assayed, it is difficult to estimate the yield, although it is believed that it will run high. The owners have worked the mine for some time, and though nothing very extensive was found, still the men stuck to it, believing that something remunerative would be found to repay them for the time they had worked.

SAN BERNARDINO COUNTY.

The Copper World property, about 35 miles from Blake, is proving to be a veritable bonanza, and the camp is growing. A carload of ore is being shipped regularly every three or four days, and the output will be increased as the mines are further developed.

SAN DIEGO COUNTY.

The Roberts gold mine at Escondido has been bonded to Capt. John Ried, from the East. The bond is for 60 days, at the end of which time Captain Ried agrees to pay \$9,000 for the property if the mine is satisfactory. The arrangement practically amounts to a sale. Captain Ried has begun sinking a shaft which will be 150 feet in depth. He is now down 35 feet and the ore is showing up well.

The Llewellyn Iron Works Co of Los Angeles secured the contract for the installment of the cyanide plant to be placed at the Golden Cross Mines at Hedges. The plant will have a capacity of 300 tons per day.

There has been some opposition to the erection of this plant, and it remains to be seen as to whether or not it will be a success when it is completed.

Although there is an indebtedness of \$1,000,000 due the Golden Cross Mining Company from the Free Gold Mining Company, which is now the owner of the mines, the Golden Cross Company will be barred from taking any part in the pending lawsuits until the amount still due James Spiers and others shall have been paid. This amount is about \$50,000. The original indebtedness of the Free Gold Mining Company to James Spiers and others was about \$145,000, but more than \$300,000 has already been paid as a result of the litigation, the greater part going to the attorneys. A claim for \$275,000 attorneys' fees was recently filed in the United States Court in Los Angeles.

Work on the tailings at the Stonewall Mine, Cuvamaca, by the cyanide process is progressing vigorously. Outsiders believe that Straus & Shin, the owners of the plant, are netting at least \$100 a day. As the work has been going on for a year and will continue for another year, the profits of this enterprise will be considerable.

SHASTA COUNTY.

The sale of the Mammoth Mine near Kennet is virtually consummated. J. F. Coleman the broker, asked by wire from Halifax, Nova Scotia, for terms by which a payment of \$50,000 could be made Jan. 1 and the remaining \$50,000 on April 1. The request was granted. The result was the virtual sale of the mine on the terms asked. The purchasers are Nova Scotian and English capitalists, headed by Walter C. Boak of Halifax. Mr. Boak is an East Indian merchant and ship owner. As soon as he confers with his London partners, steps will be taken towards the plan of operations on the property. The same people have a bond on the Balaklalla property, and also hold a bond on the Lowdon-Friday group. What Mr. Lowden's figures are does not concern the public, but A. J. Wallace, R. M. Saeltzer, Antone Jaegel and Joseph Kahny are to receive \$100,000 for the Mammoth in two payments to be concluded April 1. The Mammoth Mines are located West of Kennet and are quite often referred to as the Jackson group.

SIERRA COUNTY.

At the Magnolia mine, which is situated between Goodyear Bar and Forest City, there are eight men employed under the management of E. E. Brown. The tunnel which is being run to tap the channel is now in about 200 feet and the work of pushing the tunnel ahead is rapidly progressing.

COLORADO.

Leadville is certainly in for another boom, possibly the most important since the first great excitement. The successful outcome of the task of unwatering the downtown district, followed by the strike in the Bon Air and the Penrose mines, gives assurance of sufficient values yet remaining in that district to interest capital in that region. Besides the home company there are operating in the downtown district the Northern Mining Company, producing eighty tons daily of carbonates, the Newell shaft, which is developing; the Colorado, mining twenty-five tons daily; the Midas, developing; the Orion, shipping twenty tons daily; the Weldon, sixty tons; the Nubian, developing; the Bohn, fifty tons.

Cripple Creek is a whirl of excitement with new strikes, new deals and a great stock speculation. The ore output still swamps all reduction works. The Uncle Sam, a fraction of 2.17 acres, has been sold for \$67,500, and the Blanche Gold Mining Company, with a capital stock of \$1,500,000, will operate the property.

Ballard Mine on Breece hill in Lake County is making a success in the development of ore bodies carrying high values in gold. The mine is shipping twenty to thirty tons per day of ore that runs from four to five ounces in gold and is sending over the dump large quantities of milling gold that will average half an ounce in gold.

IDAHO.

The Seven Devils country of Idaho is progressing with great rapidity.

The Boston and Seven Devils Copper Company is developing the Decorah, South Peacock and other mines. In the Decorah they are running a tunnel, which is now in about 250 feet, and they expect to tap the ledge any day. On the South Peacock they are sinking a double compartment shaft. This shaft is now down 150 feet, all the way through good ore, some of which assays 65 per cent in pure copper. This shaft sinking will be prosecuted during the winter, and it is expected the shaft will before Spring reach a depth of 500 feet or more.

Other companies are doing satisfactory work on their copper properties.

MICHIGAN.

The recent drop of $1\frac{1}{2}$ cents a pound in the selling price of Lake copper means a lessening of the annual profits of the Calumet and Hecla Mine to the amount of about \$1,350,000. The loss is not a serious one, for the Calumet and Hecla, even with its profits thus grievously curtailed, will remain the most profitable mine in the world, earning profits each year seven times as great as the total amount of money required in developing the mine. The best mines in the Lake District are making copper around seven to eight cents a pound, which, with copper selling at seventeen cents, means a profit of more than 100 per cent. Copper at fifteen cents is high, and there seems every reason to believe that that price will be obtained for several years to come. The high price of the past twelve months has been caused by demand and not through cornering of production. Pig iron, steel, tin and zinc are selling at approximately twice the price of last year, and there is no talk of a corner in any of those metals. It is possible to greatly increase the tonnage

of pig iron of this country, as well as of most other iron-producing nations, on short notice, for there are many idle or abandoned mines which can be reopened in a few weeks, or months, but the finding of new sources of copper supply is a matter of years. The development of a copper mine from grass roots requires two to five years. The Arcadian, which had the advantage of a group of old mines, already opened upon a small scale, succeeded in making copper in eighteen months after work was resumed, while the Baltic opened from grass roots, there being merely a ninety-foot exploration shaft on the property when the present management took hold two years ago, got to stamping in eighteen months, but it will require fully another year to get the Baltic into shape to feed these stamps, and it will require five or ten years thereafter for the mine to get its full growth.

MINNESOTA.

A continuation in the drop in iron ore freights to \$1.25 has brought out a large tonnage of ore for movement this fall. One large mine that was not expected to start up at all has decided to ship 30,000 tons this season. It is Sauntry, an enormous property of the American Wire Trust. The indications are that, if the weather remains fair a few days more, shipments of the year will crowd 16,500,000 gross tons, fully a million more than the expectations of the most sanguine.

The Rockefeller Company has resumed work at its Hull and Rust Mines, Mesaba Range, and will employ 500 men there. Sellers, of the same group, has doubled its force of men for the winter months.

The Biwabic mines will work all winter.

Chandler, Vermillion range, has shipped 750,000 tons, and will close in one week. Minnesota, on the same range, has shipped 430,000 tons, and will get out 60,000 more. Pioneer, Zenith and Savoy have stopped shipments, and Zenith is closed down for the present.

The National Steel Company is at work at Chapin with the idea of increasing the already enormous output of this great mine another year.

MISSOURI.

The Jameso tract of 240 acres at Lehigh, seven miles west of Joplin, is sold to C. W. Rinehart, representing the Avondale Mining Company of Indiana, Ohio and Massachusetts men organized under the laws of Missouri with a capital of \$200,000. The purchase price was \$75,000. The land has been a great producer in the past and the Company will put in a big pumping plant and do extensive development work.

The Cowan & Webb lots on the Boston-Springfield ground in Gordon Hollow, southwest of Joplin, were sold this week to C. E. Demarest of Kansas City for \$18,000.

The Club Mining Company, operating four lots on the ground of the Continental Zinc and Lead Company just west of Joplin, has sold its property to Edwin H. Moehr of Boston, for \$12,500.

The "Little Boss" Mine at Granby, owned by Superintendent John Kingston of the Granby Company, W. H. Saunders and Wm. Pierce, was sold for \$7,500.

Four-fifths of the Oregon Mine at Granby was sold last week for \$2,400.

MONTANA.

The outcome of the suit brought by MacCallum & Clautier against the Gold Coin Mining & Milling Company, to recover \$4,400 for goods furnished the company, is that Deputy Sheriff J. J. Welsh left Anaconda, last week to attach the mines.

This is the second action brought against the company recently, as it was only a week or so prior to this suit that the Butte Hardware Company sued to recover \$850, and attached a quantity of wood.

The Gold Coin Mining and Milling Company's plant is situated about 16 miles west of Anaconda, and was worked during the summer of 1898 with a force of 60 men. It consists of a free gold milling proposition, with a 30-stamp mill. The mine is well developed, and has been worked with a considerable force since resuming operations in June of this year.

The Montana Ore Purchasing Company has won its suit against the Butte & Boston for the condemnation of a lot of ground to be used by it as a tailing dump near the M. O. P. smelter and concentrator. Judge Clancy decided the case in the plaintiff's favor, having had it under advisement for several months. The condemnation was strongly opposed by the Butte & Boston Company on several grounds, chiefly for the alleged reason that the company needed the ground itself for the same purpose. The area of ground involved comprises about 60 acres.

NEVADA.

The Dexter Mine at Tuscarora, Nevada, is sending in good reports of the operations being carried on there. The ore body is showing up in better condition now than for some time past, and if matters continue to brighten as they have the past few weeks, we can expect the mine to take its place as a steady producer again soon.

Syl. Light and Tom Donahue are taking out very rich ore in Aurora, Esmeralda Co.

George A. Green of Nine Mile has purchased the Silver Hill Mine in Aurora, Esmeralda County.

The mines at Ruby Hill, Eureka County, are shipping large quantities of ore. About 60 men are employed.

Lee Brothers & Farrington are building an arrastra in Huntoon Valley, Esmeralda Co.

One of the largest reduction plants that is tributary to the Southern California field has been placed in successful operation at Searchlight, a few miles east of the Inyo County line, near Vanderbilt.

The properties bearing silver, gold and copper to a remarkable degree are controlled by a Boston syndicate. The mines have been opened to such an extent that the demands of a reduction plant became apparent. This mill last week was completed and placed in operation, daily consuming tons of ore.

E. T. Colman, who is favorably known among Los Angeles mining men, is the manager of the property.

OREGON.

In a thirty hours' run with a No. 4 Bryan Mill \$12,000 was saved at the Golconda Mine at Sumpter. Eighty-five per cent of the gold was saved on the plates. On the 200-foot

FOREIGN MINING NEWS

BRITISH COLUMBIA.

Rosland shipments of ore for the year to date 150,324 tons. Last year for the same length of time, the shipments were under 120,000 tons. Le Roi has shipped nearly 80,000 tons this year; War Eagle, 50,000; Center Star, 10,000, and Iron Mask about 5,000 tons.

The Giant Ledge has been cross-cut on surface and is 17 feet wide. A compressor plant will be installed. The shaft will be an incline, following the ore on the hanging wall. The ore carries good values in gold, silver and copper. They expect to have 1,000 tons on the dump by January 1st ready for shipment.

The Humming Bird, in Boundary, has been employing three shifts the past six weeks. The ore body is from thirty inches to six feet wide. Ready for shipment are 400 tons that will run \$20 per ton.

On the west coast of Vancouver Island, there is a good deal of development work under way on properties owned by Americans, particularly at the head of Bedwell Sound and along Bear River. A wharf has been constructed on salt water, and a trail, large enough for wagon or tramway has been constructed from the wharf to the mines. The Canadian Pacific Navigation Company now makes this a regular port of call. It is said that the mines are sufficiently developed to permit the shipment of 100 tons monthly. When the tramway is installed, this can be easily quadrupled.

At Sechart, on Barclay Sound, the Wisconsin men owning the Searchart iron and copper mines are actively engaged in developing the properties, and they have developed the fact that the mines are more valuable for copper than for iron. They regard this as unfortunate by reason of having purchasers ready to take the property at a good round price, provided a large deposit of Bessemer iron was shown. This property was at one time held at \$1,000,000, and was under consideration by representatives of the Japanese Government at that price.

MEXICO.

Over twenty million dollars' worth of silver ores have been reduced to bullion in the Guadalupe Reduction Works since their inauguration in 1883.

The San Fernando copper mines, Lower California, have been sold to Denver capitalists for \$175,000.

Not far from the Sierra Pintada placers, to which there was a great rush last summer, some Americans have discovered quartz claims rich in copper and gold. Of the 2,000 people who were in the camp last summer, only about one hundred now remain.

The Cedros Island gold mines are now controlled by Thomas R. Lombard, of New York City, who has completed the purchase of 51 per cent of the stock. He proposes to work the mines thoroughly. The cyanide process will be employed, and a plant erected for the treatment of the ore.

Manager L. A. Wright, of La Republica Mine in Agua Dulce Canyon, Lower California, reports that the property is showing better than the first assays promised. The company now developing La Republica is one of the richest on the peninsula. There is every indication that the property will become of

level they have 12 feet of pay ore carrying free gold and tellurides. This mine has a double compartment shaft fitted with a steam hoist. Rich ore is found at a depth of 300 feet.

The pay streak in the Clipper mine, one of the Deer Lodge group at the head of Rock Creek West of Baker City, owned by the Twin Springs Mining Co. is 12 feet wide.

The Sherman group of mines on Elkhorn Mountain, near Baker City, is being developed. The crosscut is to be extended 100 feet further, which will open up two more new veins.

The Cougar Cyanide plant at Granite, Oregon, will be placed in operation December 1st, and ore handling will probably begin then. The plant has a capacity of 250 tons per twenty-four hours.

The Searles Mines at Cornucopia have been bonded for \$700,000 to a Montreal syndicate. A large cash payment, \$40,000 has been made; that is, the owners receive \$25,000 and the sum of \$15,000 has been placed in bank to carry development forward during the entire term of the bond, or until the final payment is made on the contract in the spring of next year.

The Little Giant Mining Company of Liverpool, England, which purchased some dredging ground on Powder River near Sumpter, has purchased a dredge for \$50,000 and purposes working the gravel for the gold known to exist in the ground at this point.

SOUTH DAKOTA.

The Homestake Mining Company has commenced the erection of an electric cyanide plant near the stamp mills, in which it is proposed to treat the several thousand tons of tailings. Experiments during the past few months have shown that this process will take out all of the gold values in the tailings. The plant will employ about fifty men.

Ore is being hauled to the Golden Reward Smelter from one of the Hardin Mines, in the Two Bit District. This camp had a great boom two years ago, which brought five Chicago companies to the front. They started to sink five separate shafts and the Original Hardin reached quartzite and opened up a wide shoot of pyritic ore of fair grade. The companies all closed down a year ago. The Original Hardin, Chicago & Two Bit, and Hercules Companies will start up again this year for a steady run. It is believed that the Two Bit District is underlaid with rich shoots of ore on the quartzite level.

UTAH

"Colorado talent has again invaded Tintic and is now in possession of the Watts group of eight locations, for which it has bound itself to pay \$50,000 on or before the expiration of a year," says Mr. E. L. Giroux, representing the purchasing crowd in which is included some of the wealthiest mining men in Colorado. The group, which is owned by the Watts Mining Company, organized a short time ago and capitalized for \$50,000, is located about 2500 feet north of the Bullion-Beck and adjoins the Dagmar Company's ground. In the contract by which the deal is undertaken Mr. Giroux and his associates have agreed to steadily prosecute work upon the ground, and in a few days will begin driving the tunnel, which has now been put in a distance of 400 feet, again. The tunnel is already in nicely mineralized matter from

which assays are obtained, showing gold, silver and lead. Judge T. S. Watts is President.

The sale of all the properties of the Centennial-Eureka Mining Company at Eureka, to the United States Mining Company, a Boston corporation formed for the purpose of acquiring the properties is reported as consummated. The Centennial-Eureka Company has to the present time distributed among its stockholders \$2,120,000 in dividends. The price paid for the properties is stated to be \$1,890,000 being at the rate of \$63 per share for the 30,000 shares.

During the past few days increased activity has been noticed in the local stock market and the outlook for heavy business this fall and winter is much brighter than it was two weeks ago.

Stateline, in Iron County, is seemingly prolific in important strikes of late, word being received from this rich gold and silver camp last week that in the workings of the Gold Hill ground a stringer of ore had been uncovered which was fairly bound together with wire and native silver. The find was made in a fine body of milling ore of encouraging values.

Very encouraging reports have been received of late from the Silver Shield mine in Upper Bingham, adjoining the holdings of the United States Mining Company. The new hoist which now ornaments this promising mine is now in operation, and three shifts are employed in ore extraction. A shipment of good ore from the Silver Shield is promised on the first of next month.

WASHINGTON.

The Bonanza Company, in the old Colville District, is now among the dividend payers of Washington, having declared a dividend payable on November 20, amounting to \$2,500.

In Palmer Mountain District, the Gold Hill group, consisting of forty claims, has been sold to Pittsburg people, for \$100,000 in development this winter.

Republic Mine, at Republic, Wash., pays another dividend, which makes \$530,000 paid in all. Plans are out for the new mill. Ore will be shipped to the smelter while the new mill is under construction. The haul will be thirty-five miles, formerly it was eighty miles.

The building for the new 100-ton mill at Mt. Lion is complete, awaiting installation of machinery, which is arriving daily.

The machinery recently ordered for the Princess Maud Mine, consisting of compressor plant is arriving. The roads being in bad shape has delayed its delivery.

The new shaft in the Gopher is down fifty feet, and they are sinking at the rate of three feet per day. It is proposed sinking until the 200-foot level is reached when they expect to cut the ledge.

In the Tom Thumb Mine, a good strike is recorded on the 150-foot level, the ore assaying \$100 a ton.

In Miller River District, surveys are being made for an electric line from the Cleopatra Mine to the Great Northern. This road will be constructed for the purpose of transporting the ores of the whole district. At present this district is made accessible by corduroy roads constructed by King County and roy mine owners, but the new electric line will make ten shipping mines where there was but one before.

vast value. There are 55 men, white and Mexican, on the payroll. This number will be increased considerably within a month, when work begins on the new stamp mill. The present mill has ten stamps, but twenty more will be added, making La Republica mill the largest in the northern district of the peninsula. A telephone line is being put up to connect with Ensenada, 45 miles southwest. A cyanide plant, capable of handling the tailings as they accumulate will also be added. The main working shaft of the mine is now down 175 feet on an incline, and the tunnel is into the mountain or hillside 400 feet.

Latest Mining Decisions.

Prepared for THE MINING AND METALLURGICAL JOURNAL, by
Andrews & Murdoch, Berrien Springs, Michigan.
Credit must be given when reprinted.

The lessee of mining property is not the agent of the owner, but simply has a qualified interest in the property, which entitles him to the use of it for his benefit. *Wilkins et al. vs. Abell et al.*, 52 Pac. Rep. (Colo.) 612.

The office of a proviso is to limit, rather than to enlarge; and the proviso in Section 8 of the Mechanics' Lien Act, as amended (Sess. Laws, 1895, p. 203) that the section shall not apply to owners of mines who lease the same in small blocks, does not enlarge the section by making it apply to all owners who do not so lease their lands. *Wilkins et al. vs. Abell et al.*, 56 Pac. Rep. (Colo.) 612.

Where the locator of a lode claim lodges his certificate with the proper officer for record within three months from discovery, and the officer notifies him that it will be recorded, he has done all that is required of him by Mills' Ann. St. § 3150 (Gen. St. 1883, § 2399), requiring that he shall record his claim in the office of the County Recorder by a location certificate within that time. *Shepard vs. Murphy*, 58 Pac. Rep. (Colo.) 588.

The Mechanics' Lien Act, as amended (Sess. Laws 1895, p. 202, § 2), providing for a lien against mining property in favor of those who do work or furnish material for the development of mines, applies only where such work or material is furnished on a contract made with the owner of the property, or one acting by his authority as agent or contractor, and not where the contract was made by and for the benefit of a lessee. *Wilkins et al. vs. Abell et al.*, 58 Pac. Rep. (Colo.) 612.

A notice of lien for labor performed on certain mining claims and a smelter, filed under Section 1387, Rev. St. 1898, should properly state the amount of lien claimed upon each piece of property, upon which labor was performed, so far as the claimant is able to state it; yet whether the amount claimed in the lien is the just sum due must be left for the determination of the trial court, and where it appears that the labor was performed by the day on the several properties, and it is difficult to segregate the amount of each piece, a notice of lien, complete in other respects, which states the full amount due as due on each property, under the circumstances shown, is properly admitted in evidence. *Garner vs. Van Patten*, 58 Pac. Rep. (Utah) 684.

The Steel and Wire Trust is buying more mines and has recently added several on the Menominee range. It has sold 700,000 tons of vessel room for 1900 to the Carnegie Steel Company.

PERSONAL NEWS ITEMS

ROSS B. BROWN has returned to San Francisco from a professional trip to Nephi, Utah.

D. G. WARNER the well known Helena, Mont., Mining man is in Los Angeles, Cal., on business.

WM. M. COURTIS, of Detroit, Mich., has been reporting on some mining properties in Colorado.

J. H. DAVIS, the Tucson banker and mining man was one of the visitors to Los Angeles, Cal., last week.

H. GRAFTON VERCOR, is temporary in charge of the Riverside Gold Mines, Limited, near Perris, California.

A. P. BRAYTON, Sr., President Pelton Water Wheel Co., San Francisco, is home from an extended European tour.

CHARLES D. BURRAGE, of Boston, Treasurer of the Utah Consolidated of Bingham, has been spending some days in Utah.

J. ELLIOTT the mining man and capitalist of Nelson, British Columbia, is spending the winter in Southern California.

COL. GEORGE W. E. DORSEY, returned a short time ago to Salt Lake City from the east where he has been on important mining business.

F. A. KELLOGG, Superintendent of the Gladstone Mining Company's property at Chloride, Arizona, made a visit to Los Angeles, Cal., last week.

O. O. HOWARD, JR., President Ratcliff Consolidated Gold Mines, Ltd., and the Mt. Shasta Gold Mines, Ltd., has returned to San Francisco from New York.

EDMUND B. KIRBY, of Denver, Colo., has been appointed manager of the War Eagle mines at Roseland, B. C., and will in a few days start for his new field of labor.

URIAN DUDLEY, of Melbourne, Australia, is making an extended tour of observation of California mines. He is the founder of the Society of Australasian Mining Engineers.

GEORGE MOORE, the manager of the Salt Lake City cyanide sampling department of the American Smelting and Refining Company, has been in the east during the past week on business and pleasure combined.

F. E. WARE, Vice-President Mt. Shasta Gold Mines, Ltd., and President Bertha G. M. Co. of Sonora, Mexico, has gone from San Francisco to Mexico on an inspection of the new mill which is about completed at the mines.

DEAN & JONES, of Los Angeles, have installed two gas engines for mining purposes in the Slate range, forty miles north of Johannesburg. One is 27 horse power for operating a stamp mill and ore crusher. The other is 7½ horse power for pumping.

MAX LOHR one of the principal stockholders of the London and Liverpool Exploration Co., of Salt Lake City, Utah, was among the visiting mining men in Los Angeles, Cal., last week. Mr. Lohr and party left for Phoenix, Arizona the middle of the week.

W. R. SHILLING, Superintendent of the Red Rover Mine at Acton, Los Angeles County, Cal., was in Los Angeles the other day. There is but little work being done at the mine now but it is expected operations will soon be resumed. The shaft is now down 700 feet with indications of good ore being found in the near future.

W. H. COOLIDGE, of Boston, general counsel of the United States Mining Company, who visited the Company's Bingham property a week ago, was agreeably surprised and very much pleased with the magnificent showing in the consolidated mines over which J. W. Neill presides as general manager. Mr. Coolidge also inspecting the Centennial-Eureka, was delighted with conditions as exhibited in the workings of this splendid dividend payer.

CYRUS OSBORNE BAKER, Jr., of Baker & Co., the platinum buyers and refiners of Newark, N. J., made the JOURNAL's, Los Angeles, Cal., Office a visit during his recent trip west. Very little is known to the average miner concerning the conditions under which platinum is found, and for that reason, we have made arrangements with Mr. Baker who is an expert in the mining and reduction of platinum, to secure from him a series of articles pertaining to the physical, chemical and commercial properties of that metal.

HON. JAMES MCGREGOR, for many years connected with the Crescent mine at Park City, expects to leave in the near future for Bayhorse, Idaho, where he will look after the property of the Salmon River Mining Company, in which he is the principal stockholder. This property, at the present time, is being worked by leases, and during the past few months they have shipped in the neighborhood of 100 tons of ore to the Salt Lake market, the metallic contents of which averaged about 63.5 per cent lead and 70 ounces in silver to the ton.

NEW INCORPORATIONS IN THE MINING AND METAL INDUSTRIES

COLORADO

Mozart Mining Co., Denver. General mining business. Capital, \$50,000. Incorporators: E. F. Sayre, L. P. Kimball, G. H. Campbell, R. H. M. Smith, F. O. Hall, all of Denver.

Diamond Gold Mines Co., Denver. General mining business. Capital, \$1,000,000. Incorporators: S. W. Mudd, H. J. Stephens, P. Brooks, all of Denver.

Castleraine Mining & Leasing Co., Cripple Creek, General mining business. Capital, \$50,000.

Michigan-Wyoming Copper Co., Colorado Springs. General mining business. Capital, \$1,000,000.

Cripple Creek Claim Co., Cripple Creek. General mining business. Capital, \$40,000. Incorporators: J. P. Hadley, J. D. Husted, J. G. Raine, all of Cripple Creek.

Calumet Mexican Copper Mining Co., Denver. General mining business. Capital, \$100,000. Incorporators: P. P. O'Ryan, E. W. Bassick, L. D. Sweet, all of Denver.

Gillett Herzog Manufacturing Co., of Minneapolis, Minn. General mining business. Capital, \$75,000.

Columbia Coal Mining & Mercantile Co., of Boulder. General mining and miners' supply house. Capital, \$20,000. Incorporators: C. F. Wolfer, F. J. Buchheit, E. Smith, W. Phipps, T. Taylor, all of Boulder.

East River Gold Mining & Milling Co., Crested Butte. General mining business. Capital, \$800,000. Incorporators: F. Samsill, J. W. Rockefeller, B. P. Bennett, all of Crested Butte.

Union Mining & Fluxing Co., Denver. General mining business. Incorporators: H. George, of Denver; C. Henkel, G. Holmes, both of Pueblo.

Oregon Mining Co., Pueblo. General mining business. Capital, \$50,000. Incorporators: D. R. Greene, H. Hernean, G. M. Greene, all of Pueblo.

Colorado Gold Producing Co., Denver. General mining business. Capital, \$1,000,000. Incorporators: W. A. Hunt, A. W. Pratt, S. R. Pratt, all of Denver.

Hondee Lead Mining Co., Lake City. General mining business. Capital, \$1,500,000. Incorporators: F. S. Reardon, W. F. Roe, P. L. Reardon, all of Lake City.

Bancroft Mining Co., Salida. General mining. Capital, \$50,000. Incorporators: E. E. Colgazer, H. W. Broadbent, of Wyandotte County, Kansas; T. D. Bancroft, C. B. Coffin, S. C. Payne, all of Salida.

Grand Junction Mining & Fuel Co., Denver. General mining business. Capital, \$30,000. Incorporators: P. F. Sharp, J. M. Buchanan, G. Smith, all of Denver.

Gold Calf Consolidated Mining Co., Colorado Springs. Capital, \$1,500,000. Incorporators: T. J. Burkholder, G. E. Lindley, W. F. Greenwood, E. Arkell, T. F. Dillon, all of Colorado Springs.

Gray House Gold Mining Co., Cripple Creek. Mining business. Capital, \$1,250,000. Incorporators: A. T. Jones, N. S. Gandy, H. M. Blackwell, all of Cripple Creek.

Blue Mountain Copper Mining Co., Colorado Springs. Capital, \$1,500,000. Incorporators: L. E. Sherman, J. M. Auld, H. B. Neff, J. M. Kellogg, all of Colorado Springs.

Hillon Gold Mining Co., Denver. General mining business. Capital, \$1,250,000. Incorporators: M. Pinnerty, W. H. Day, Jr., of Colorado Springs; J. E. Billups, S. Aldrich, J. W. Graham, all of Denver.

Titanic Gold Mining Co., Denver. General mining business. Capital, \$1,500,000. Incorporators: G. E. R. Lewin, E. B. Coe, M. B. Carpenter, De Putron Glidden, W. W. Wishon, D. E. Heller, Dr. J. McKey Glidden, all of Denver.

Little Jewel Mining Co., Denver. General mining business. Capital, \$10,000. Incorporators: J. P. Ridgway, I. J. Wood, M. Berger, all of Denver.

DELAWARE

Connecticut Zinc Co. Mining lead, zinc, etc. Capital, \$100,000. Incorporators: L. B. Plimpton, E. Cady, E. B. Dow, H. S. Bullard, all of Hartford, Ct.

United States Aluminum Mining Co. Capital, \$500,000. Incorporators: J. L. Woolcott, J. Virdin, J. Lord, all of Dover.

ILLINOIS

Chicago-Auburn Co., Auburn. Mining coal. Capital, \$2,500. Incorporators: R. R. Bradley, M. F. Sullivan, both of Chicago; W. Nichols, of Auburn.

Roya Mining Co., Chicago. General mining and milling business. Capital, \$30,000. Incorporators: R. H. Lanyon, F. Pischel, F. W. Klippel, all of Chicago.

Federal Lead & Zinc Co., Chicago. General mining and milling business. Capital, \$50,000. Incorporators: C. G. Blanden, J. P. Savert, F. B. Penne, all of Chicago.

Spurgeon Mining Co., Chicago. Mining and smelting business. Capital, \$6,000. Incorporators: J. G. Adams, A. Jarvis, R. E. Burke, all of Chicago.

MAINE

National Mexican Mining Co., Portland. Capital, \$1,000,000. Incorporators: F. S. James, of Evanson, Ill.; J. Nichols, of Hartford, Ct.; W. A. R. Boothby, of Waterville, Me.

Big Six Gold Mining & Milling Co., Portland. General mining business. Capital, \$250,000. Incorporators: H. L. Baker, of Boston; W. S. Kent, of Melrose; H. C. Farr, of Portland.

NEW HAMP.

Handy Bros. Mining Co., West Bay City. General mining business. Capital, \$60,000. Incorporators: G. W. Handy, T. L. Handy, C. W. Handy, F. Handy, all of West Bay City.

Wolverine Development Co., Marshall. General mining and smelting business. Capital, \$50,000. Incorporators: F. A. Stuart, of Marshall; J. B. Watson, D. Warner, of Bronson; G. Macord, of Battle Creek.

MISSOURI

Combination Zinc Mining Co., Kansas City. General mining and smelting business. Capital, \$50,000. Incorporators: A. F. Nathan, O. S. Bowman, H. A. Willson, J. W. Young, all of Kansas City; R. S. Harris, of Galena, Kan.

Wheel Of Fortune Lead & Zinc Mining Co., Carthage. General mining business. Capital, \$24,000. Incorporators: W. Patten, W. McMillan, E. N. Beach, of Carthage; E. Summerfield, of Lawrence, Kan.; A. J. Stein, of Terre Haute, Ind.

Reinder Mining Co., St. Louis. General mining business. Capital, \$15,000. Incorporators: A. J. Isch, R. McConnell, J. H. Higginbotham, C. P. Woodruff, all of St. Louis.

Helen Zinc & Lead Mining Co., Joplin. General mining business. Capital, \$200,000. Incorporators: W. W. Gregg, of Joplin; W. H. Cleminshaw, J. P. Kilfoyl, C. W. Somers, all of Cleveland, O.; J. J. McPherson, L. P. Cunningham, both of Joplin, Mo.

Miller Hollow Zinc Mining Co., Kansas City. General mining business. Capital, \$100,000. Incorporators: W. E. Sweetzell, W. Huttig, G. P. Snyder, J. G. Streat, all of Kansas City; J. E. Tutton, W. E. Best, O. W. Sparks, all of Columbus, Kan.

Juggernaut Zinc Mining Co., Kansas City. General mining business. Capital, \$60,000. Incorporators: F. A. Hornbeck, J. U. Bruner, E. O. Haight, A. L. Howe, N. S. Doran, J. D. Eubank, all of Kansas City.

Magnolia Zinc & Lead Co., Joplin. General mining business. Capital, \$200,000. Incorporators: W. H. Wells, T. Dolan, Mrs. E. Spurgin, all of Joplin; J. P. Carman, E. A. Snowman, J. H. Ripley, W. W. Radcliffe, all of Springfield, Mass.

Eight Forty-Eight Mining Co., Kansas City. General mining business. Capital, \$2,500. Incorporators: A. T. Parmer, J. Reynier, R. Murphy, D. W. Vaughan, R. U. Griffith, all of Kansas City.

NEW HAMPSHIRE

Boston Reduction Co., Boston. General mining business. Capital, \$500,000. Incorporators: W. H. Burtin, E. C. Ketchum, C. H. Burleigh, B. A. Paige, all of Boston; N. P. Curtis, of Newton.

NEW JERSEY

Colorado Maid Mining Co.—Principal office, No. 259 Washington street, Jersey City. Mining. Capital, \$1,000,000. Incorporators: Samuel H. Gainsburg, William S. Long, Alex. J. Halter, of New York; Henry Ullman, Jersey City; George T. Coleman, Denver, Col.

Clio Mining & Milling Co.—Principal office, No. 1 Exchange Place, Jersey City. Mining, etc. Capital, \$500,000. Incorporators: G. L. Dayton, Charles C. Keely, Jersey City; Theodore Kurode, Hackensack, N. J.

Alaska Industrial Co.—Principal office, No. 243 Washington street, Jersey City. Mining, etc. Capital, \$10,000,000. Incorporators: Charles N. King, Robert A. Lawrie, Charles C. Levenson, all of Jersey City.

Honduras Milling & Land Co.—Principal office, Pier G, Jersey City (Lehigh Valley Railroad). Mining, etc. Capital, \$150,000. Incorporators: Anderson Fowler, Charles E. Wickers, A. J. Toomey, New York City; J. W. Ebbs, Englewood Cliff, N. J.

Joplin-Galena Consolidated Zinc and Lead Co.—Principal office, the Corporation Trust Co. Building, Jersey City, N. J. Mine and manufacture of zinc, lead, etc. Capital, \$1,000,000. Incorporators: Charles E. Pennoyer, Benjamin F. Hersh, Percy W. Crane.

Quaker City Lead & Zinc Mining Co.—Principal office, No. 427 Market street, Camden, N. J. Mine lead, zinc, etc. Capital, \$250,000. Incorporators: Charles N. Apple, George Nebeker, Charles F. Elkinton, all of Camden, N. J.

New Jersey & Missouri Zinc Mining Co.—Principal office, New Jersey Registration & Trust Co. Building, East Orange, N. J. Mining of zinc, etc. Capital, \$100,000. Incorporators: Frederick W. Garvin, C. Frederick Smith, Edward B. Hawkins.

NEW YORK

Congo Coal Mining Co., New York City. General mining business. Capital, \$300,000. Incorporators: H. W. Merwin, C. W. Dodd, J. J. Daly, of Brooklyn; W. L. Ball, P. M. Gersheim, of New York City.

OHIO

Kennon Coal Co., Cleveland. General mining business. Capital, \$2,100. Incorporators: J. A. Hobson, C. A. Townsend, V. N. Marsh, J. P. Townsend, H. B. Townsend.

PENNSYLVANIA

Donahue Coke Co., Greensburg. General mining business. Capital, \$180,000. Incorporators: T. Donahue, J. P. Donahue, J. U. Kuhne, S. F. Potter, W. A. Wilson, all of Greensburg.

WASHINGTON

Bonanza Mining and Milling Co., Dayton. Capital, \$50,000. Incorporators: R. A. Jackson, H. Patrick, C. P. Curll, all of Dayton.

Vanadium Mining Co., Dayton. General mining business. Capital, \$50,000. Incorporators: R. P. Sturdevant, R. B. Brown, J. W. Doling, J. M. Miller, all of Dayton.

Red Mountain Gold Mining Co., New Whatcom. Capital, \$1,000,000. Incorporators: H. G. Anderson, C. W. Both, of Nooksack; C. L. Scrimsher, J. M. Boyd of New Whatcom; W. A. Hall of Seattle.

Pacific Coast Mining and Prospecting Co., Everett. Capital, \$2,000,000. Incorporators: Joseph Mayer, G. Schley, both of Everett.

Gold Coin Mining Co. of Alaska, Seattle. Incorporators: L. C. Dillman, W. W. Spaulding, of Tacoma; L. H. Griffith, J. H. Hughes of Seattle.

Mastadon Gold and Copper Co., Spokane. General mining business. Capital, \$200,000. Incorporators: J. O. Bender, W. F. Powell, both of Spokane.

Lane Foot Mining Co., Spokane. General mining business. Capital, \$100,000. Incorporators: H. F. Baer, L. Baer, B. Blakeslee, all of Spokane.

Wehe Consolidated Mining & Milling Co., Weherville. General mining and milling business. Capital, \$11,000,000. Incorporators: A. M. Wehe, of Weherville, Wash.; C. W. Preston, W. A. McCain, both of Blanchard, S. D.

Kootenai Valley Mining & Milling Co., Spokane. Capital, \$100,000. Incorporators: C. S. Edwards, H. A. McClure, A. C. Burrows, all of Spokane.

Cedar Canyon Consolidated Mining Co., Spokane. Capital, \$75,000,000. Incorporators: S. Rosenhaupt, W. J. C. Wakefield, J. H. Peet, C. Theis, all of Spokane.

McKinley Consolidated Gold Mining Co., Spokane. Capital, \$50,000. Incorporators: W. F. Vaughn, M. P. White, O. Kratz, all of Spokane.

Examiner Mining Co., Spokane. Capital, \$25,000. Incorporators: W. P. Keeler, M. Forrest, C. H. Jelsett, C. E. Klingman, all of Spokane.

Three Zones Mining Co., Seattle. Capital, \$1,000,000. Incorporators: W. E. Bronson, B. Foster, C. Tucker, all of Seattle.

Hecla Copper Mining Co., Seattle. Capital, \$100,000. Incorporators: A. M. Watt, F. B. Bourg, H. L. Harding, all of Seattle.

Triquois Copper Mining Co., Seattle. General mining business. Capital, \$100,000. Incorporators: F. Wright, C. T. Moore, G. Kenyon, all of Seattle.

Imperial Gold & Copper Mining Co., Seattle. Capital, \$100,000. Incorporators: J. H. Lyons, E. Tracey, H. Tarnow, all of Seattle.

America Britannia Mining Co., Everett. General mining business. Incorporators: F. J. Riley, C. Campbell, both of Everett.

WEST VIRGINIA

Boston Adirondack Gold Mining Co., Boston, Mass. General mining and milling business. Capital,

\$1,000,000. Incorporators: A. E. Woodbury, of Hudson; C. C. Corbett, C. A. Godly, F. E. Tuttle, of Boston, Mass.; E. P. Bellows, of Gloverville, N. Y.

English American Gold Mining Co., New York City. General mining business. Capital, \$1,000,000. Incorporators: L. H. Dospassos, J. J. Schmidt, T. P. Farrell, E. P. Charles, T. P. Lannon, all of New York City.

Water Creek Zinc Mining Development Co., Yellville, Ark. General mining and milling business. Capital, \$5,000,000. Incorporators: H. H. Gansberger, C. J. Wood, J. P. Klein, J. H. Gansberger, A. Newell, all of Chicago.

Annie Gifford Gold Mining Co. of Arizona. London, Ont. General mining and milling business. Capital, \$500,000. Incorporators: A. E. Ganed, T. A. Conley, F. H. Robinson, W. S. Murray, H. C. Simpson, all of London, Ont.

Forest Coal Mining Co., Fairmont. General mining business. Capital, \$100,000. Incorporators: E. P. Evans, J. E. Sulger, P. M. Diver, P. W. Heas, H. E. Johnson, all of Philadelphia, Pa.

Fairmont & Baltimore Coal & Coke Co., Fairmont. General mining business. Capital, \$100,000. Incorporators: J. A. Clark, C. D. Judkins, of Fairmont; G. W. Baer, M. McD Price, of Baltimore, Md.; E. M. Court, of Columbia, O.

Chicago Gold Placer Mining Co., Chicago, Ill. General mining and milling business. Capital, \$1,000,000. Incorporators: E. Haynes, E. P. Atfield, H. M. Dewar, P. J. Howard, T. Haynes, all of Chicago, Ill.

Topsy Mining Co., Denver, Col. General mining and developing business. Capital, \$100,000. Incorporators: S. S. Murphy, A. C. Anderson, S. B. Bradley, B. M. Carr, E. J. Churchill, all of Denver, Col.

Cabin Creek Coal Co., Charleston. General coal and coke business. Capital, \$200,000. Incorporators: H. A. Robson, of Cotton Hill; L. Prichard, A. M. Prichard; H. L. Prichard, D. L. Ruffner, all of Charleston.

Roaring Spring Zinc & Lead Co., Boston, Mass. General mining business. Capital, \$100,000. Incorporators: J. A. Emery, O. W. Emery, J. N. Parks, E. E. Burlingame, all of Boston, Mass.; J. B. Mace, of Plymouth, Mass.

New England Zinc Co., Joplin, Mo. General mining and milling business. Capital, \$1,000,000. Incorporators: W. H. McManus, W. H. McMannus, Jr., of Brooklyn; J. Bronn, M. W. Geisenger, L. B. Bunker, all of New York City.

Eureka Mining & Milling Co., Pueblo, Colo. Capital, \$2,500,000. Incorporators: C. W. Shaanbrook, D. Underwood, J. Latham, C. B. Freigh, P. Anderson, all of Pueblo, Colo.

Bonanza King Mining & Milling Co., Lovelocks, Nev. General mining and milling business. Capital, \$1,000,000. Incorporators: C. S. Wynn, C. P. Gately, C. N. Denedict, W. M. Kennard, J. C. Penbody, all of New York City.

Nameless Mining Co., New York City. General mining and milling business. Capital, \$100,000. Incorporators: F. Jellenik, N. D. Stern, H. S. Weed, Tillie Richman, A. Schutzing, all of New York City.

Platt Gold Mining & Milling Co., Rochester, N. Y. Capital, \$200,000. Incorporators: O. Wilson, Jersey City; J. A. Platt, L. Platt, A. Platt, W. C. Negus, all of Livonia, N. Y.

Columbia Consolidated Mining Co., Boston, Mass. General mining and milling business. Capital, \$1,500,000. Incorporators: C. H. Russell, E. D. Robbins, H. J. Wilkins, H. A. Rideout, W. T. Seagrave.

WYOMING

Home Copper Mining Co., Rawlins. Capital, \$1,000,000. Incorporators: J. B. Osborne, W. L. Whitacy, I. C. Miller, P. Paulsen, C. P. Clemmons, all of Rawlins.

Isabel Copper Mining Co. General mining business. Capital, \$250,000. Incorporators: C. H. Brunner, G. J. Haslam, T. Carroll, J. H. Knowles, W. H. Clemmons.

Headlight Copper Mining Co. Grand Encampment. General mining business. Capital, \$1,000,000. Incorporators: C. A. Finley, W. C. Henry, P. Lee, A. P. Priest, M. J. O'Rourke, all of Grand Encampment.

Crocus Gold Mining Co., Cambria. General mining business. Capital, \$1,000,000. Incorporators: J. H. Ames, W. H. Kelly, E. Dickinson, of Omaha; N. S. Harwood, of Lincoln, Neb.; R. J. Kilpatrick, of Cambria, Wyo.

Prince Gold & Copper Mining Co., Rawlins. General mining business. Capital, \$100,000. Incorporators: J. M. Glidden, J. O. Chentham, M. T. Amonett, I. C. Miller, A. McMicken, all of Rawlins.

The Mining And Metallurgical Journal

THE MARKETS.

All quotations, financial reports and other statistical figures given under this head are New York Quotations, unless otherwise stated in each item. These figures are carefully revised each (same, and constitute a very accurate compilation of statistical matter.

METALS.

NEW YORK, Oct. 14th, 1899.

The following are the Silver, Copper and Lead quotations for the last two weeks:

	SILVER.	COPPER.	LEAD.
Nov 10	58 1/2	17 00	4 60
" 17	58 1/2	17 00	4 60
" 18	58 1/2	17 00	4 60
" 19	58 1/2	17 00	4 60
" 20	58 1/2	17 00	4 60
" 21	58 1/2	17 00	4 60
" 22	58 1/2	17 00	4 60
" 23	58 1/2	17 00	4 60
" 24	58 1/2	17 00	4 60
" 25	58 1/2	17 00	4 60
" 26	58 1/2	17 00	4 60
" 27	58 1/2	17 00	4 60
" 28	58 1/2	17 00	4 60
" 29	58 1/2	17 00	4 60

SILVER

The Silver market has been steady and dull showing only small fractional changes during the week and closing at 26 1/2 d. in London.

COPPER.

Prices remain unchanged from those quoted last week. Lake copper 18 1/2 c. Electrolytic in cakes, wirebars and ingots 17 @ 17 1/2. Cathode 16 1/2 @ 16 3/4 c. casting copper 17 nominal. The foreign market is still dominated by difficulties betw. England and Transvaal. London

is quoted, English tough £78, 15s @ £79 1/2, best selected £80 5s @ £80 15s India sheets £83 @ £84 10s

LEAD

Lead continues in good demand and with no change in prices. New York being quoted at 4.55 @ 4.60.

The foreign market has been irregular but the tendency is upwards. Spot is quoted at £15 17s 6d @ £16 2s 6d for Spanish and £16 5s @ £16 7s 6d for English, while futures are at a discount of 5s to 10s

SPLITTER

The disquieting news from the ore-fields stirred up consumers and a good business has resulted at stiffening prices, New York is quoted at 5.45 @ 5.50

The foreign market is also firmer and again higher good ordinaries being quoted at £22 12 6d, Specials £22 17s 6d

ANTIMONY.

Antimony is in good demand. We quote Cooksons at 10 1/2 @ 11 c. Hallett's at 9 1/2 @ 9 3/4 c. U. S. Star and Hungarian 7 1/2 @ 8 1/4 c.

NICKEL.

Nickel continues unchanged and no alternation of prices can be reported. We quote for ton lots 33 @ 36 c per lb., and for smaller orders 35 1/2 @ 38 c. London prices are 14 @ 16 d. per lb., according to size of order

IRON

It is quite natural that this article, which is always volatile should suffer in consequence of the unsettled state of affairs abroad and the higher money market. Fluctuations have been rather wide but the close is again firm at £145 15s for spot and £146 2s 6d for three months

In New York the buying was restricted

to quantities needed to cover immediate requirements although consumption continues at a fair rate. We quote Straits in-land lots at 32 1/2 c. f. o. b. New York

PLATINUM

The demand for Platinum is good and prices are firmer. New York is quoted \$17.75 per ounce for large lots and \$18 for smaller orders.

POTASSIUM CYANIDE.

Purified, 98 @ 99 per cent., in cases of 120 lb. at 80 c. per lb. in 5, 10, 25 and 50 lb tins at an advance.

QUICKSILVER

The wholesale price in New York has advanced \$1 and is now \$48.00 per flask. The London price has risen to £8 17s 6d per flask, with the same rate from second hands

THE MINOR METALS

Quotations are given below for New York delivery.

Aluminum.	
No. 1, 99 per cent. ingots, per lb.	35 @ 37 c
No. 2, 90 "	31 @ 34 c
Rolls sheets, per lb.	35 c up
Aluminum, Nickel, per lb.	33 @ 36 c
Alum bronze, per lb.	20 @ 23 c
Bismuth, per lb.	14 @ 16 c
Phosphorus, per lb.	4 @ 6 c
Magnesium, per lb.	7 @ 8 c
Tungsten, per lb.	70 c
Ferro-tungsten, 50 per cent.	60 c

*Variations in price depend chiefly on the size of the order.

ACIDS.

Acetic is in good request, muriatic is moving briskly on contract, and sulphuric is unchanged. Blue vitriol is quiet. Only 50 blis. oxalic acid were imported this week.

The exports from the United States in August amounted to \$12,653.

AMMONIUM

There are no arrivals. Spot best unmixed second \$22 @ \$22.50 per ton and shipments \$21.15; thirds, \$19. The imports of brimstone into the United States in August were 11,109 tons

NITRATE OF SODA

Demand is very quiet and quotations for all positions are nominally \$1.65 per 100 lbs. Odd lots can doubtless be had at \$1.62 1/2. The United States imported 18,708 tons nitrate of soda in August

CHEMICALS

Most of the business done in heavy chemicals is for future delivery, the little doing on spot being at advanced prices. Imports this week included 200 drums, 210 casks and 2 blis. bleaching powder. Importers expect a curtailment of shipments from England. When the Boer war is on, as the merchant vessels will be used for transporting troops to South Africa. Receipts of domestic goods at New York last week included 1055 sacks alkali and 250 drums caustic soda.

Caustic soda high test is quoted per 100 lbs. f.o.b. works at 1.77 1/2 @ 1.82 1/2, in New York, \$1.85 @ \$1.90. Bi-carbonate of soda is quoted per 100 lbs. f.o.b. works, \$1.12 1/2 @ \$1.25. Chlorate of potash crystals in New York are quoted for domestic, \$8.75 @ \$9.00, foreign, \$9.25 @ \$9.75; powdered domestic at \$9.25 @ \$9.50, and foreign, 9.50 @ 9.75.

CHLORIDE OF LIME

English prime brands are quoted at 1.65 @ 1.75 with 1.50 @ 1.60 for other brands.

CLING-SURFACE

In Your

Belts will

ADD

At Least

15%

to their

Power.

WE KNOW this is true for the simple reason that we have about 200,000 Belts throughout the world doing this every day, because they have Stopped Slipping and are running easy, with increased contact of belt on pulley—which means power. CLING-SURFACE keeps a belt soft and pliable, preserves it and makes it absolutely **Waterproof**. Rubber belts will also stop slipping and run slack. We guarantee the above.

CLING-SURFACE MANF. CO., 167-172 VIRGINIA ST.,
BUFFALO, N. Y.

Represented in Salt Lake City by

Utah Rubber and Manf. Co.

Patent Pending



Perfect Cupels

Can be made by anyone with ease and dispatch with

Galkins' Cupel Machines

Compact, easily operated, can't get out of order, everlasting.

No Assay Office Complete without one.

Descriptive pamphlet and price list mailed on application.

F. W. BRAUN & CO., Assayers Goods of every Description.

LOS ANGELES, CAL.

The Automatic. This machine will make five sizes cupels of ideal perfection. Capacity 600 an hour. Three designs and grades.

RIVETED SHEET STEEL WATER PIPE

For Meters, Water Powers, Irrigation, Etc.

THE WEIGLE PIPE WORKS

2349 S. Broadway St.

DENVER, COLO.



LARGEST GASOLINE PUMPING PLANT IN THE WORLD

The illustration shows the gigantic pumping plant recently built by the Hercules Gas Engine Works at the Parker Ranch, Colusa Co. 40 h. p. Hercules Engine, pumping 7200 gallons a minute 27 feet high. Burns Gasoline or Distillate oil. Cheap power known. Gas, Gasoline and Oil Engines, 2 to 300 h. p. Send for Catalogue. **MERCURUS GAS ENGINE WORKS,** 216 Bay St., San Francisco.

FINANCIAL NOTES.

AVERAGE PRICES OF METALS.

In New York per 100 lbs. from January

1st, 1899:	Copper	Tin	Lead	Spelter
Month				
January	14.75	22.48	4.18	5.34
February	14.75	22.48	4.49	5.38
March	17.01	23.82	4.37	5.31
April	17.01	24.98	4.31	5.27
May	18.25	25.75	4.44	5.38
June	17.01	25.85	4.43	5.38
July	18.25	26.61	4.52	5.42
August	18.60	31.53	4.57	5.52
September	17.46	31.74	4.58	5.50
October				
November				
December				

Average

AVERAGE MONTHLY PRICES OF SILVER.

In New York per ounce Troy, from January 1st, 1899, and for the years 1898 and 1897:

Month.	1899	1898	1897
	Cents	Cents	Cents
January	59.35	56.77	64.79
February	59.42	56.77	64.79
March	59.64	56.90	64.79
April	59.64	56.90	64.79
May	61.2	56.98	64.79
June	60.1	56.61	64.79
July	60.36	59.06	64.79
August	60.00	59.54	64.79
September	58.8	60.68	64.79
October		60.42	64.79
November		60.00	64.79
December		59.42	64.79
Year		58.26	64.79

MONEY IN CIRCULATION.

Comparative statement of the circulation in the United States on Oct. 1st 1899. Comparison being made with statement on September 1st, 1899.

	October 1, 1899	Changes
Gold	\$46,954,185 D.	\$26,377,697
Silver	147,801,028 I.	3,399,532
Legal Tender	314,954,600 I.	4,824,179
Treas'y & N'TID'k Notes	3,988,956 D.	483,165
Totals	\$1,434,014,745 D.	\$16,634,661

Gold and Silver certificates and currency are not included in this table. By adding the amounts given in this table with those in the following will give the

total amount coined or issued. The figures herewith are furnished by the Bureau of Statistics Treasury Department.

MONEY IN TREASURY.

Comparative statement of changes of money in United States Treasury on Oct. 1st 1899, comparison being made with statement, on Sept. 1st, 1899.

	October 1, 1899	Changes
Gold	\$122,271,649 I.	\$18,215,225
Silver	115,511,794 D.	4,600,183
Legal Tenders	11,264,116 I.	4,824,179
Treas'y & N'TID'k Notes	4,509,547 I.	352,191
Totals	\$253,557,106 I.	21,981,678

The Gold and Silver bullion on hand in the Treasury is not included in this statement

GOLD AND SILVER EXPORTS AND IMPORTS.

At all United States ports, for the month of September, 1899, and 9 months ending September, 1898, and 1899:

	September, 1899	9 months ending Sept., 1899
Gold—Exports	\$3,302,810	\$18,995,925
Imports	\$16,808,341	\$2,593,724
Excess	\$13,505,531	\$16,402,201
Silver—Exports	\$1,152,003	\$3,622,041
Imports	\$1,151,407	\$2,376,846
Excess	\$0,000,000	\$1,245,195

NINE MONTHS ENDING AUGUST

	1898	1899
Gold—Exports	\$12,781,921	\$37,877,838
Imports	127,343,816	34,268,421
Excess	\$114,561,895	\$3,609,417
Silver—Exports	\$39,431,500	\$38,238,431
Imports	21,099,234	22,724,005
Excess	\$18,332,266	\$15,514,426

This statement includes the exports and imports at all United States ports, the figures being furnished by the Bureau of Statistics of the Treasury Department.

WANTS

COPPER MINE. State full particulars in regard to development work location, distance from water, price of fuel, character of ore and returns from shipments. Must have at least 1500 feet of development work. Send all information possible. Address,

JAMES HOWARD,
Care The Mining and Metallurgical Journal,
32 Broadway St., New York, N. Y.

NOTICE TO STEAM USERS.

The National Association of Stationary Engineers is prepared to furnish Engineers of guaranteed ability for any plant in the city or elsewhere. Give us a call. Address: J. T. CHAMBERS, Sec'y
Engine Room City Hall
Tel Main 557. Los Angeles, Cal.

FOR SALE

WILL GIVE one-half interest in a group of five gold claims on the desert for parties who will put up mill and cyanide plant. Address,
Journal Office, Los Angeles, Cal.A DEVELOPED, producing and dividend paying Gold Mine, machinery on ground in active and successful operation. A large copper deposit partly developed with splendid showing. A fine gold silver prospect partially developed, lack of capital reason for sale. For reports, maps, etc. Address,
H. P. DORRILL, El Paso, TexasTRINAM Two Stamp Steam Mill at Tucson, Arizona. 15-H. P. Boiler Pump and every thing complete, set up ready for work. In excellent condition, used less than six months. Address DRIDGING MINING MACHINERY CO.
Kansas City, Mo.

ANTIMONY BISMUTH PROSPECTORS having locations of this nature and wishing to sell at once for cash, will do well to address with full particulars, P. O. Box 2078, SAN FRANCISCO, CAL.

CHEMIST, 5 years training and knowledge of Mineralogy, desires position with prospecting party or as assistant in laboratory. Highest endorsements. Address,
J. W. FILL, Asheville, N. C.

FOR SALE AT A BARGAIN.

A 60-TON copper smelting plant, consisting of two 30-ton furnaces, one of which has new seamless liner. Plant is complete in every detail. Also an 8-ton Silver-Lead Furnace, entirely new, never having been set up. All of the above located immediately adjacent to railroad. Enquire of G. A. ROYER, WORTHEN & CO., dealers in Mining and Mill Supplies, Tucson, A. T.

The Cleveland Mining and Stock Exchange Co.

New England Building, Cleveland, Ohio.

A Reliable Information Bureau for Miners and Investors to obtain FACTS Regarding Capital and Mines. Stocks and Mines listed. Send for prospectus.

Morgan-Watson Mining and Construction Co.

800-810 New England Building, Cleveland, Ohio

MINES AND STOCKS { We Buy, Sell, Lease and Bond Mines of all kinds
We Buy, Sell, and Negotiate sales of mining and other stocks.
We Furnish Machinery to work good mines under special arrangement
We Furnish Capital to develop mines.

JAMES IRVING & CO. REFINERS ASSAYERS

Largest and most complete establishment in Southern California Cyanide and Mill Test.



Mint Prices paid for Gold and Silver Bullion. Returns made within four hours after receipt.

128 N. Main Street (Old Location.) Los Angeles, Cal.

W. O. ABBOTT, ASSAYER

ASSAYING IN ALL ITS BRANCHES
CHEMICAL DETERMINATIONS ACCURATELY MADE

TOMBSTONE - - - ARIZONA

STEEL CASTINGS

From 1 to 40,000 pounds weight

Of Open Hearth or Chester Steel. True to Pattern, Sound, Solid. Casting of all kinds and Crank Shafts, Shoes, Dies, Crusher Plates, Bases, Tappets and Roll Shafts. Steel Castings of every description.

Chester Steel Castings Co.,

Works Chester, Pa. Office, Liberty St. Phila., Pa.



Quartz Screens

A specialty. Round, slot or burred slot holes. Genuine Russell Iron, Homogeneous Steel, Cast Steel or American plated Iron, Zinc, Copper or Brass Screens for all purposes. CALIFORNIA PERFORATING SCREEN CO., 144-147 Reale St. S.F.

WOODBURY CONCENTRATOR



223 First St., San Francisco, Cal.

Sulphuric Acid

Also Strictly Chemically Pure

AMMONIA and for Laboratory Use and Fine Chemical Work.

Manufactured by the Western Chemical Co., Denver, Col. For Chlorination, Refining and other processes. Also Muriatic and Nitric Acids, Blue Vitriol, Copperas Refined Sulphate of Soda, Etc.

G. P. Acids

The Jackson Hand Power Rock Drill

Handled and Operated by One Man will do the work of Two to Four Men.

We Supply Everything for Mines and Mining

THE JACKSON DRILL & MFG. CO.

Write for Circular.

1756 Larimer Street, Denver, Colo.

THORNTON N. HOTLEY COMPANY, (Inc.)
43 John St., New York.

INCORPORATED MINES PAYING DIVIDENDS.

	NAMES OF MINES	LOCATION	No. of Shares	Capital Stock	Par Value	Amount of last Dividend	Date of Last Dividend	Total Amount Paid in Dividends	Kind of Mines Produced
1	Aetna Cons.	California	100,000	500,000	\$ 5	10	Oct 1899	195,000	Q.
2	Alamo	Utah	125,000	125,000	1	02	April 1899	2,500	G, O, L.
3	Alaska, Treadwell	Alaska	200,000	5,000,000	25	37 1/2	July 1899	4,115,000	G.
4	Alaska Mexican	Alaska	200,000	1,000,000	5	10	July 1899	111,031	G.
5	Anaconda Copper	Montana	1,200,000	30,000,000	25	2 00	Nov 1899	12,150,000	C.
6	Anchoria Leland	Colorado	600,000	600,000	1	03	Apr 1899	198,000	G.
7	American Gold	Colorado	300,000	3,000,000	10	09	June 1899	431,000	G, S, L.
8	American Coal	Maryland	60,000	1,500,000	25	1 25	Sept 1899	727,500	Coal
9	American Zinc, Lead and Smelting	Missouri	200,000	500,000	25	10	Oct 1899	40,000	Z, L.
10	Aurora	Michigan	100,000	2,500,000	25	50	June 1899	890,000	L.
11	Argonaut	California	200,000	2,000,000	10	10	Aug 1899	340,000	
12	Bald Butte	Montana	250,000	250,000	1	06	Sept 1899	717,141	G, C, S.
13	Bonanza Development	New Mexico	300,000	3,000,000	10	3 50	June 1899	1,500,000	
14	Boston & California	California	600,000	600,000	1	01	June 1899	72,000	
15	Boston and Colorado Smelting	Colorado	15,000	750,000	50	5 00	April 1899	375,000	
16	Boston & Montana Con.	Montana	150,000	3,750,000	25	10 00	Aug 1899	12,275,000	G, C, S.
17	Breece	Colorado	200,000	5,000,000	25	05	Sept 1899	60,000	L.
18	Bullion Beck and Champion	Utah	100,000	1,000,000	10	10	Sept 1899	2,408,100	G, S.
19	Bunker Hill and Sullivan	Idaho	300,000	3,000,000	10	07	May 1899	705,000	S, L.
20	Cariboo	British Col.	800,000	800,000	1	01 1/2	Feb 1899	248,905	G.
21	Calumet & Hecla	Michigan	10,000	2,500,000	25	20 00	Sept 1899	64,850,000	C.
22	Centennial Eureka	Utah	30,000	1,500,000	50	50	Aug 1899	2,150,000	S, L.
23	Central Lead	Missouri	10,000	1,000,000	100	50	Sept 1899	127,000	L.
24	Charleston	S. Carolina	10,000	1,000,000	100	2 00	June 1899	200,000	
25	Colorado Smelting	Montana	100,000	1,000,000	10	1 00	Jan 1899	1,945,000	G, S, C.
26	Consolidated Tiger and Poorman	Idaho	1,000,000	1,000,000	1	02	Dec 1898	20,000	G, S.
27	Creston Leasing	Colorado	1,000,000	1,000,000	1	01	Dec 1898	54,700	
28	Crowned King	Arizona	600,000	6,000,000	10	02	Dec 1898	232,000	G, S, L.
29	De Lamar	Idaho	40,000	2,000,000	5	12	May 1899	2,316,000	G, S.
30	Deer Trail No. 2	Washington	1,000,000	1,000,000	1	25	Sept 1899	10,000	
31	Doe Run	Missouri	5,000	500,000	100	50	Sept 1899	85,000	L.
32	Empire State Idaho	Idaho	75,000	750,000	10	30	Sept 1899	229,375	
33	Fanny Rawlings	Colorado	1,000,000	1,000,000	1	01	Aug 1899	20,000	G, S.
34	Farris-Haggerty	Wyoming	1,000,000	1,000,000	1	00 1/2	Mar 1899	5,000	C, G, S.
35	Garfield Consolidated	Colorado	1,200,000	1,200,000	1	01	May 1899	34,000	G.
36	Golden Star	Ontario, Canada	100,000	100,000	1	01	July 1899	41,000	
37	Gold Coin of Victor	Colorado	1,000,000	1,000,000	1	01	Sept 1899	240,000	G.
38	Gold King	Colorado	1,000,000	1,000,000	1	03	July 1899	60,000	G.
39	Golden Cycle	Colorado	200,000	1,000,000	5	05	Sept 1899	228,500	
40	Grand Central	Utah	250,000	250,000	1	24	Sept 1899	684,250	G, S, C, L.
41	Gwin	California	20,000	1,000,000	50	25	Aug 1899	81,500	G.
42	Grass Valley Exploration	California	50,000	100,000	2	25	July 1899	12,500	
43	Helena and Frisco	Idaho	500,000	2,500,000	5	25	June 1899	550,000	S, L.
44	Highland	S. Dakota	100,000	10,000,000	100	20	July 1899	3,924,718	G.
45	Holy Terror	S. Dakota	300,000	300,000	1	01	July 1899	112,000	G.
46	Homestake	S. Dakota	125,000	12,500,000	100	50	Sept 1899	7,824,750	G.
47	Horn Silver	Utah	400,000	10,000,000	25	05	July 1899	5,270,000	S, L.
48	Idaho	British Col.	500,000	500,000	1	05 1/2	Jan 1899	292,000	
49	Isabella	Colorado	2,250,000	2,250,000	1	01	Sept 1899	472,500	G.
50	Jack Pot	Colorado	1,000,000	1,000,000	1	04	Sept 1899	75,000	G.
51	Jamison	California	300,000	3,000,000	10	10	April 1899	50,700	
52	Lake Superior Iron	Michigan	84,000	2,100,000	25	1 00	Feb 1899	736,000	L.
53	Lillie	Colorado	1,000,000	1,000,000	1	05	Sept 1899	279,110	G.
54	Modoc	Colorado	500,000	500,000	1	02	Sept 1899	170,000	G.
55	Montana Lid	Montana	660,000	3,300,000	5	12	Apr 1899	2,997,557	G, S.
56	Montana Ore Purchasing	Montana	40,000	1,000,000	25	1 00	Sept 1899	1,200,000	
57	Morning Star	California	2,400	240,000	100	3 00	Sept 1899	744,600	G.
58	Mercur	Utah	200,000	5,000,000	25	12 1/2	July 1899	1,291,000	G.
59	Mammoth	Utah	400,000	10,000,000	25	15	Sept 1899	1,530,000	G, S, C, L.
60	Mead	California	2,000,000	2,000,000	1	20	June 1899	120,000	G.
61	Monument	Colorado	300,000	300,000	1	01	Dec 1898	12,624	
62	Moulton	Montana	400,000	2,000,000	5	05	Feb 1899	480,000	
63	Mt. Shasta	California	20,000	100,000	5	30	May 1899	8,000	
64	New York & Hon. Rosario	Central A.	150,000	1,500,000	10	10	Sept 1899	1,110,000	S, G.
65	Napa Cons.	California	100,000	700,000	7	30	Oct 1899	1,010,000	Q.
66	New Idria Quicksilver	California	100,000	500,000	5	30	Oct 1899	170,000	G.
67	North Star	California	200,000	2,000,000	10	25	Apr 1899	550,000	Q.
68	Original Empire	California	50,000	5,000,000	100	1 00	May 1899	500,000	G.
69	Osceola	Michigan	50,000	1,250,000	25	3 00	June 1899	2,801,500	C.
70	Parrot	Montana	230,000	2,300,000	10	1 50	May 1899	2,600,898	C.
71	Pennsylvania Consolidated	California	51,500	5,150,000	10	20	Sept 1899	105,575	
72	Pioneer	California	100,000	1,000,000	10	12 1/2	Mar 1899	82,500	G.
73	Portland	Colorado	3,000,000	3,000,000	1	02	Sept 1899	2,347,080	G, S.
74	Plumbago	California	300,000	300,000	1	15	Jan 1899	46,000	G.
75	Quicksilver Pref.	California	43,000	4,300,000	100	50	May 1899	1,845,411	Q.
76	Quicksilver Consolidated	California	57,000	5,700,000	100	40	July 1899	643,807	Q.
77	Quincy	Michigan	100,000	2,500,000	25	6 00	August 1899	11,070,000	C.
78	*Republic Consolidated	Washington	3,000,000	3,000,000	1	01	Sept 1899	323,000	G.
79	Rambler-Cariboo	British Col.	1,000,000	1,000,000	1	01	April 1899	50,000	
80	Royal Consolidated	British Col.	2,500,000	2,500,000	1	01	June 1899	1,050,000	G.
81	Sacramento	Utah	1,000,000	5,000,000	5	00 1/2	Sept 1899	135,000	G.
82	Small Hopes Consolidated	Colorado	250,000	5,000,000	20	10	Feb 1899	3,325,000	S.
83	South Swansea	Utah	150,000	150,000	1	05	Sept 1899	150,000	S, L.
84	Standard	Idaho	500,000	500,000	1	06	Apr 1899	1,745,100	G, S.
85	Standard Consolidated	California	200,000	20,000,000	100	10	Aug 1899	3,879,226	G, S.
86	St. Joseph	Missouri	30,000	3,000,000	10	50	June 1899	2,859,500	L.
87	Silver King	Utah	150,000	3,000,000	20	25	Sept 1899	2,250,000	S, L, G.
88	Smuggler	Colorado	1,000,000	1,000,000	1	01	Sept 1899	1,185,000	S, L, Z.
89	Swansea	Utah	100,000	500,000	5	05	Oct 1899	241,000	S, L.
90	Tamarack	Michigan	60,000	1,500,000	15	4 00	June 1899	5,910,000	C.
91	Tomboy	Colorado	200,000	2,000,000	10	4 00	May 1899	730,000	G.
92	Utah	Utah	100,000	1,000,000	10	02	Jan 1899	170,000	G.
93	Vindicator Consolidated	Colorado	1,500,000	1,500,000	1	05	July 1899	253,750	G.
94	War Eagle Consolidated	British Col.	2,000,000	1,000,000	1	01 1/2	Sept 1899	114,000	
95	Wolverine	Michigan	60,000	2,500,000	25	1 50	Oct 1899	270,000	C.
96	Yellow Aster	California	100,000	1,000,000	10	10	Sept 1899	253,789	G.

S. Silver; G. Gold; L. Lead; O. Copper; Q. Quicksilver; I. Iron; Z. Zinc.
 N. B.—Companies not listed paid nothing in the last twelve months. *Paid since consolidation, \$203,000; Republic paid \$120,000 under old management.

THE CAMMETT CONCENTRATOR

Designed with some Regard for the Laws of Concentration

The perfect vanner motion given to the pulp by our head motion together with the freedom from "pumping" resulting from the special rigid guides used, explains why the Cammett riddles never "pack" and why the table has such a great capacity when handling slimes.

The continuous grooves and riddles extending from end to end of the table maintains the greatest possible margin of safety between the concentrates discharge and the tailings

Thoroughly protected by strong patents

Write for Circular.

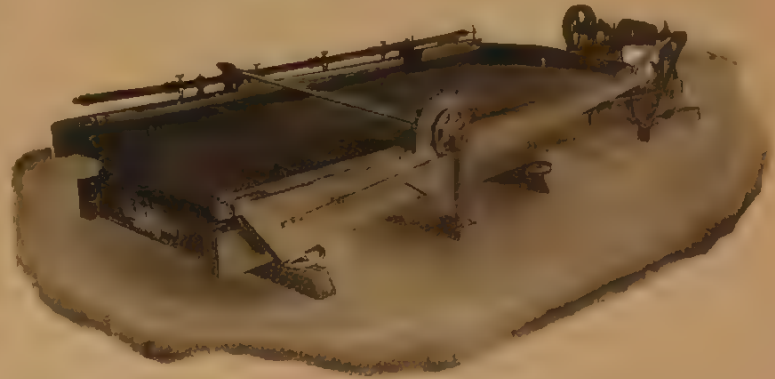
Denver Engineering Works,

Shepard & Searling,

Sole Manufacturers.

30th and Blake Sts.

Denver, Colorado.



Mining, Milling and Smelting Machinery

— LEYNER AIR DRILLS —

Hoisting
Engines



Air Com-
pressors

Reynolds Corliss Engines

The Edward P. Allis Company,

Milwaukee, Wisconsin

SULLIVAN MACHINERY CO.

CHICAGO, ILLINOIS

Sullivan Diamond Prospecting Drills

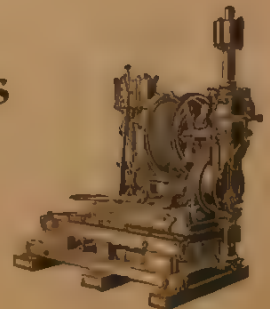
FOR PROSPECTING FOR and DEVELOPING MINERALS

Rock Drills for Sinking, Drifting and Stopping



Denver, Col. Office: 332 Seventeenth Street

New York Office: 71 Broadway
Henshaw, Bulkley & Co., Agents, San Francisco, Cal.



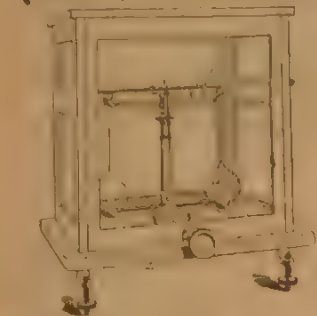


The Detroit Lubricators In Good Company.

Fully 9-10ths of the prominent American engine builders use The Detroit Lubricators on their engines. They will not equip an expensive engine with an inferior or mediocre lubricator as their experience has taught that the risk is too great. This preference by those best qualified to judge of their merits is the best recommendation that could be given our goods. Our catalogue showing our different lubricators, glass and brass oilers, oil pumps, etc., will be sent on application.

DETROIT LUBRICATOR CO., Detroit, Mich.

QUEEN NO. 4 ASSAY BALANCE



Aluminum Beam, Agate Knives and Plates Sensibility 1-100 mg. The Best Low-Price Assay Balance on the Market. Send for Circular.

QUEEN & CO.

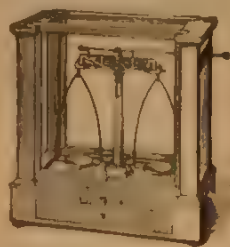
Optical and Scientific Instrument Works
1010 Chestnut Street,
N. Y. Office, 59 Fifth Ave. Philadelphia

ESTABLISHED IN 1840

HENRY TROEMNER,

170 Market St.

Philadelphia, Pa.



Assay Balances and Weights

In use in all the U. S. Assay Offices
In America

PRICE LIST ON APPLICATION

WHY

Spend your money to buy new machinery to put on Unproved Mines which may not be a success when you can buy Pumps, Hoists, Shafting, Pulleys, Air-Compressors, Engines, Boilers and in fact any Machinery you need for a Mine or Mill, as good as new, at the

Denver Variety Machine Shops, THOS. CROW, Prop.

Write for Prices and Particulars.

1712 Blake St., DENVER, COLORADO

Spadone's Concentrator Belts Patented



This illustration shows the edge flanging outwardly as it passes over the pulley. This relieves the strain from the top and bottom of the edge by directing the strain automatically to the inside face surface of the edges. Therefore all belts have been so constructed that when they pass over the pulleys or rolls, a direct strain comes upon the top or at the base of the edges, causing the edges to break away from the body of the belts in a very short time. *Wear Mechanical Belts by Spadone's Concentrator Belts.* Belts made to fit any machine—4, 5 and 6 feet wide. Prices and samples on application.

Send us your order for Water, Air Drill, Steam, Suction and Fire HOSE, RUBBER BELTING, RUBBER PACKING and LEATHER BELTING.

Amalgam Plate Cleaners. Our Amalgam Plate Cleaners are made of Pure Rubber in moulds, thus insuring a plate cleaner which will not scratch the plates and a perfect edge which will clean the Amalgam plates evenly. They are made 6 inches long, 4 inches wide and 1/2 inch thick, making a convenient size to handle. Price by mail to any address each 25c. Correspondence solicited. The Gutta Percha Rubber & Mfg. Co., 30 and 32 Fremont St., San Francisco, Cal.

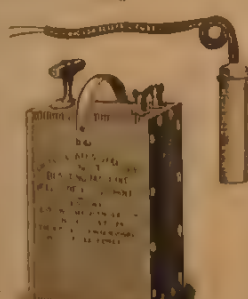
Electric Blasting Apparatus.

Adapted for Firing all Kinds of Explosives used in Blasting



Victor Electric Platinum Fuses Superior to all others for exploding any make of dynamite or blasting powder. Each fuse folded separately and packed in neat paper boxes of 50 each. All tested and warranted. Single and double strength with any length of wires.

Blasting Machines. The strongest and most powerful machines ever made for electric blasting. They are especially adapted for submerine blasting, large



SEND FOR CATALOGUE

railroad quarrying, and mining works.

Victor Blasting Machine. Fires 5 to 8 holes, weighs 15 lbs., adapted for prospecting, etc.

MANUFACTURED ONLY BY

JAMES MACBETH & CO., 128 Malden Lane, New York, U. S. A.

BRANCH OFFICE: 308 MARKET STREET, SAN FRANCISCO, CAL.

Second Hand Machinery.

Specialties

PULLEYS

SHAFTING

BELTING

BOXES

RAILS

BOILERS

ENGINES

HOISTERS

STAMP MILLS

CABLE and all but little used

THE S. S. MACHINERY CO.

Denver, Colorado

J. A. FAY & EGAN CO. CINCINNATI, OHIO

Wood Working Machinery

FOR

Box Factories, Planing Mills, Sash, Door & Blind Factories
Carriage, Wagon and Agricultural Shops.

HENSHAW, BULKLEY & CO., Agents, San Francisco, Cal.



Ores! Ores! Ores!!

Gold, Silver and Lead Ores and Concentrates

Purchased at Reduced Rates for Treatment.

Selby Smelting and Lead Co.

416 MONTGOMERY ST., San Francisco

Consign Shipments to Vallejo Junction, Cal

WEIS & GIBSON,

Assayers and

Analytical Chemists

51 Clark St., Chicago, Ill.

Assays and analyses of all kinds. Mail orders promptly attended to. Mining properties examined and reported upon. Terms upon application.



AINSWORTH NO. 1

Sensibility, 1/1000th of a gramme

This is a short beam balance and especially adapted for smelters and assay offices where extreme accuracy and rapidity are perquisites.

Wm. AINSWORTH & SONS

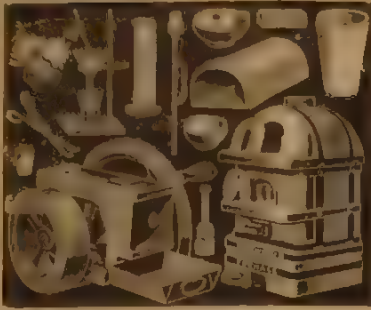
1261 LAWRENCE ST.

DENVER, COLO.



THE JEFFREY MFG. CO. 412 1/2 STREET, COLUMBUS, OHIO.

Western Branch, 412 1/2 STREET, DENVER, COLORADO



Denver Fire Clay Co

Assayers' and Chemists' Supplies

MANUFACTURERS OF

Crucibles, Scoopifiers & Muffles
And all other kinds of

Fire Clay Material.

SPECIALTIES Strictly c. p. Acid
Test Lead, Bone Ash, Cyanide
Potash, Argol, Borax, Borax Glass
Iron Sulphides, Litharge, Soda
Mining Fluxes, etc.

Sole Agents for the
Almworth Balances

OFFICE:

3101-3141 Blake St., 1742-1748 Champa St., Denver, Col.

NEW HAVEN MFG. COMPANY

NEW HAVEN, CONN.

IRON WORKING TOOLS,



Engine Lathes, Pulley Turning Lathes, Iron Planers
Slotters, Upright Drilling Machines, Horizontal
Drilling and Boring Machines, Etc.

MENSHAW, BULKLEY & Co., Agents, San Francisco, Cal.



SMITH & THOMPSON
Manufacturers of
Fine Assay Balances

Write for Catalogue
2210 Stout St., Denver, Colo.

NEW STANDARD CO.

INCORPORATED

Manufacturers of the New Standard
CONCENTRATOR
323 POTOMAC BLOCK, LOS ANGELES, CAL.

ADVERTISE YOUR

WANTS

IN OUR "WANTS" COLUMNS

"The Mining and Metallurgical
Journal" reaches the very peo-
ple with whom you wish to
speak. Try it.

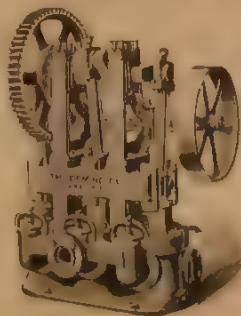
Don't Fail to Read Page 8a in this issue.

THE DEMING

TRIPLEX POWER PUMP

The Best Made

Steel Crank Shafts, Cut Gearing, Outside
Packed Plungers, Single and Double
Acting Triplex Electric Pumps



THE OTTO GAS ENGINE

51000 IN ACTUAL USE

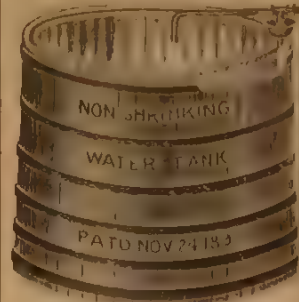
The Original, the Highest Efficiency and
Most Economical



Menshaw, Bulkley & Co.,

AGENTS

SAN FRANCISCO, CAL.



TANKS

OF EVERY DESCRIPTION

Mines, Mills and Cyanide Plants
Patent Non-Shrinking Water Tanks

The only Tank that will stand the Desert
and Hot Climate

Write for Catalogue and Estimate on any kind
of Tank Work

Pacific Tank Co.

348 E. 2nd St., LOS ANGELES, CAL.
35 BEALE ST., SAN FRANCISCO, CAL.



To Gold Miners!

Silver Plated Copper AMALGAMATING PLATES

For Saving Gold In Quartz and Placer Mining.

EVERY DESCRIPTION OF MINING PLATES MADE
Only Best Copper and Refined Silver Used. Old Min-
ing Plates Replated. Twenty-six Medals Awarded.

Gold Silver Nickel Copper & Brass Plating

Old mining plates bought or taken in exchange for new
silver plated plates and all other kinds of plates. Every plate is
plated at moderate rates by a new and improved process. The plates
which then contain a surplus of gold, thus the cost of plating, can be
replated.

Denniston's San Francisco Plating Works

657 Mission Street, cor. Annie, San Francisco, Cal.
Telephone, Main 1031.

E. G. DENNISTON,

Proprietor

Send for Circular.



R. A. PEREZ, E. M.

Assayer and Chemist

Manager of the Bi-Metallic Assay Office and Chemical Laboratory

Assaying of Ores, Furnace Products, etc.

Amalgamations and Cyanide Tests Carefully Made

Formerly: Underground and surface surveyor for the Coshiba and Alamo Coal Co.
and Mexico.

Chief Chemist for the White Iron Furnace, P. M. Oram, N. J.

Chief Assayer for El Paso Smelting Works, El Paso, Texas

Assistant Chemist Consolidated Kansas City S and R Co., Argentine, Kan.

120 North Main Street,

Los Angeles, Cal.



ESTABLISHED 1859

Herman Kohlbusch Sr.

59 Nassau Street,
New York, N. Y.

Fine Balances
and Weights

For every purpose where accuracy
is required

...

Send for Illustrated Catalogue

THE WILSON

Forged High Grade Steel

Shoes and Dies

Guaranteed to Wear Longer and Prove Cheaper than any others
Made by use of Special Appliances. Patented Aug 16th, 1893

Made only by

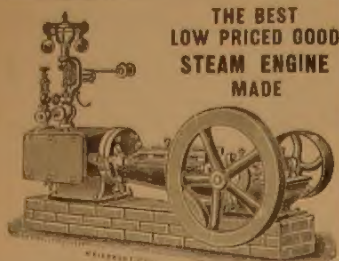
WESTERN FORGE AND ROLLING MILLS
St. Louis, Missouri

JOSHUA HENDY MACHINE WORKS

SOLE AGENTS

38 to 44 Fremont Street,

San Francisco, Cal.



THE BEST
LOW PRICED GOOD
STEAM ENGINE
MADE

Governor and Belt, Fly Wheel, Driving Pulleys, Glean Oil Cups, Drain Cocks and Sight Feed Lubricator furnished with Engine. From four to twenty horse power.

Globe Machine Works,
135-139 W. 2D ST., CINCINNATI, OHIO

Eastern Prices Beaten

Improved Facilities, Finest Work, Lowest Prices



Perforated Sheet Metals

For Flour and Rice Mills, Grain Separators, Shaker Screens, Gravel and Cement, Stamp Batteries, Iron, Steel, Russian Iron, American Planchis, Zinc, Copper and Brass Screens, for all uses.

San Francisco Pioneer Screen Works
(ESTABLISHED 1890)

231 and 223 First St., San Francisco, Cal.
JOHN W. QUICK, PROPRIETOR

Perforated Metals

GRIZZLEYS FOR PLACER MINING, BATTERY SCREENS
STEEL SHEETS FOR TROMMELS.

THE ROBT. MITCHISON PERFORATED METAL CO.
209 Dearborn St., Chicago, Illinois

FRANCIS SMITH & CO.,
— MANUFACTURERS OF —



MINING PIPES ALL SIZES

Hydraulic, Irrigation and Power Plants, Well Pipe, Etc., all Sizes.

Iron cut, punched and formed, or making pipe on ground where required. All kinds of Tools supplied for making Pipe. Estimates given when required. Are prepared for coating all sizes of Pipes with Asphaltum.

30 Fremont Street

San Francisco, Cal.

HOME MANUFACTURE
FOWLER'S
Air Space and Asbestos
Manufacturing Company
Sectional Removable Covering
for Steam Boilers, Pipes, etc.
As a Non-Conductor, Unequaled
Absolutely Fire Proof

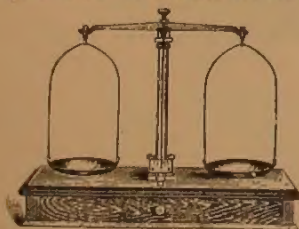


G. C. FOWLER, 656-58 Howard Street
SAN FRANCISCO, CAL.

C. DUCOMMUN,

300-302 N. MAIN STREET,

LOS ANGELES



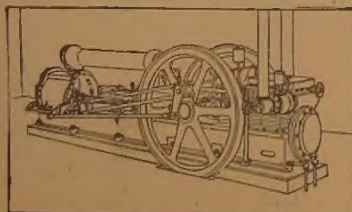
Assayers Material Mine and Mill Supplies

Dixon's Black Lead Crucibles, Denver Fire Clay Crucibles, Muffles, Scorifiers, etc.; Quicksilver, Drill Steel, Retorts, Mortars, Gold Pans, Drilling Hammers, Drifting Picks, Horn Spoons and Shovels.

NORWALK IRON WORKS CO.

SOUTH NORWALK, CONNECTICUT.

THE NORWALK AIR and GAS COMPRESSOR



In use in every State in the Union, Central America, and South America, Great Britain, etc., Also used by the U. S. Army and Navy.

Especially Designed for
Driving

ROCK DRILLS,
PNEUMATIC LOCOMOTIVES,
ENGINES, PUMPS
COAL CUTTERS.

and Other Mining Machinery. The Best Machine for Compressing Air for all Dynamic Purposes. Send for Illustrated Descriptive Catalogue.

HENSHAW, BULKLEY & CO., Agents San Francisco

Here's Some Straight Talk



Weber Gasoline Engines and Hoists

Are good.
Are all right.
Not because we say so but because others--
who know--say so.

Here's reasons:
We don't turn out poor work; if we can't do the work right and be paid a proper price for so doing.

We don't do it.
We don't want it.
We don't have to have it.

There are enough people on earth whose first desire is for quality in Engines.

This talk is pointed at them.
They are the people we are looking for.
Appreciative people, who know a good thing when they see it.

This talk has nothing to do with the man who wants a "cheap" Engine and won't have anything else.

If you want a "cheap" Engine, "cheap" Hoist, "cheap" Material, "cheap" Labor, and can see no merit in having such things rightly done.

Don't bother us.
Life's too short.
Take the job around the corner to what's his name. He'll do it cheap.

But:
If you want a better Engine, one that shall be especially good,
That's an engine of another hue.
That's where we come in.

Our only excuse for living is to afford you the opportunity to have us make that better Engine for you.

'Twon't cost as much as you might imagine, either.
We've a mighty interesting proposition to make you if you mean business.
Care to know more about it?
It's a good one. Get a catalog.

Weber Gas and Gasoline Engine Co.,

434 S. W. BOULEVARD,

KANSAS CITY, MISSOURI, U. S. A.

ORE TESTING

Complete mill for testing ores on practical scale by all processes to determine the best process adapted to treating any ore submitted. Processes in use investigated to overcome unnecessary losses, etc.

RICKETTS & BANKS,

Metallurgists & Chemists.

No. 101 JOHN STREET,

NEW YORK CITY

P. & B. PAINT

FOR MINES, SMELTERS, CHLORINATION WORKS,
THE CYANIDE PROCESS.



P. & B. Roofing put up in Rolls to lay 200 square feet, with Paint and Nails.
Absolutely Acid and Alkali Proof.

PARAFFINE PAINT CO., Manufacturers, 312-314 W. 5th St., Los Angeles

UNFAIR COMPETITION

Our recent announcement that inferior goods had been sold and billed on the Coast as our goods, and that our trademark numbers had been counterfeited, has disclosed an even greater extent of these practices than we had supposed to exist. To make the resulting damage to the reputation of our goods as small as possible and to protect our would-be patrons we repeat:

All our catalogue goods, except those listed by us as manufactured by others, are stamped with our name "Keuffel & Esser Co." or our initials "K. & E. Co.," and where there is room for it, with our trademark.

Our German drawing instruments bear only the trademarks  or  only, and goods so stamped are therefore not ours. All our goods are fully warranted to conform to the description we give of them in our catalogue and to be of the quality and grade specified. We make some lines of cheaper goods for the jobbing trade, but they differ from our catalogue goods in quality and appearance. These inferior goods are not stamped with any of our trademarks. Our catalogue goods are not furnished to any dealer or agent without our complete stamp as described above, and any claim that we furnish our catalogue goods by special arrangement without our stamp is therefore an attempt to deceive. Our special papers in rolls or sheets

Duplex Universal Anvil Baragow Normal
are watermarked or stamped along the edge with their name. Any claims that our papers are furnished by us in bulk without these names or that these papers have been obtained otherwise than through us, are absolutely false. We will thankfully accept any information bearing on the counterfeiting of our trademark numbers or the palming off of other goods as ours.
Very respectfully, KEUFFEL & ESSER CO., New York



Independent Assay Office.
ESTABLISHED 1888.

D. W. Rockhart, E. M., Proprietor.
Agent for Ore Shippers.
Assays and Chemical Analysis.
Mining Examined and Reported Upon.

BULLION WORK A SPECIALTY.

P.O. Box 98. Office and Laboratory
Cor. San Francisco and Clifton Sts.,
EL PASO, TEXAS.

GASOLINE ENGINES

Gasoline Engines from 2 to 10 horse power. Mine ventilators operated by Gasoline Engines.

TEMPLE MACHINE CO.,

1513 Wazee Street, Denver, Colorado

Buyers of

ALL CLASSES OF
BULLION, MATTE,
ORE, SILVER SUL-
PHIDES,
CYANIDES, GOLD
and SILVER BARS.

CONSOLIDATED Kansas City Smelting AND Refining COMPANY

SMELTING WORKS
LEAVILLE, COLOR.; EL PASO, TEXAS;
ARGENTINE, KAN.; DOQUILLAS, MEX.

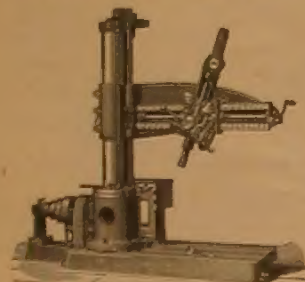
REFINERY:
ARGENTINE, KANSAS

ORE PURCHASING AGENCIES:
C. D. Porter, Spokane Wash.; J. H. Weddle, Leadville, Col.
J. H. Murray, Denver, Colo.; L. F. Feustman, City of Mex.
J. E. Jackson, Salt Lake City Utah; H. R. Simpson, El
Paso, Texas; C. E. Finney, Argentine, Kansas.

Manufacturers of

ALCHEMIST-
BRAND
BLUE VITROL
ZINC SULPHATE

Half Universal Radial Drills



The special features which have so highly recommended this style of Drills are our double columns, steel gearing, power and hand feeds, quick return motion to spindle. Furnished in three sizes, with large variety of tables, adapting the drills for every class of work possible.

Bickford Drill and Tool Co.

CINCINNATI, OHIO, U. S. A.

HENSHAW, BULKLEY & CO., AGENTS

San Francisco, Cal.

ORE CARS.

All miners who have used the Truax Automatic Ore Cars say they are the best in the market.

Over 3,000 In Use
RECORDED IN

SAN FRANCISCO, CAL., by
The Truax Mfg. Co.,
114 First Street



PATENTED:
Jan. 8, 1892. Aug. 7, 1895.
July 19, 1898.
In Canada, June 21, 1898.

MANUFACTURED IN
DENVER, COLORADO, by
The Truax Mfg. Co.
1717-1719 Wazee St.

We make all kinds of cars, skips and charging carts for the Mine, Mill and Smelter. All miners should have our pamphlet of useful information.

Dealers wanted in Mining Sections to handle the TRUAX ORE CARS.

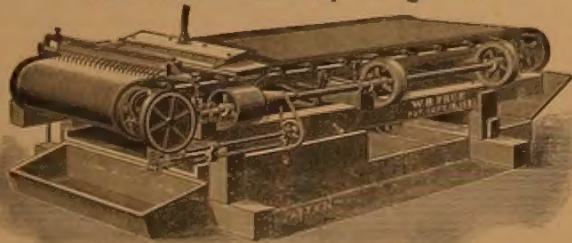
THOMAS PRICE & SON

Analytical Metallurgical and Physical Testing Laboratory

524 SACRAMENTO STREET, SAN FRANCISCO, CAL.

FOUR and SIX FOOT FRUE VANNERS

With Brownell "Patent Lip" Flange Belts



After a Concentrator like the Frue Vanner has been on the market nearly two decades, and the sales have constantly increased, it is safe to say it is the "Standard Machine of the world." More Frue Vanners have been sold during the last twelve months than for the same period at any time during the history of the machine. Practical mining men in all parts of the world where mining is carried on will testify as to its merits. It is the "standard" which all competitors are trying to imitate.

The results obtained by this machine are the "Acme" of concentration, and several cheap and untried machines that have lately come on the market compare by it, and the manufacturers will tell you that they are "just as good, and cheaper, etc." The facts are that no other concentrator made has an equal capacity, or will yield as clean a concentrate with as small loss in the tailings as the Frue Vanner. The amount saved from the lower first cost of an inferior machine counts little in the years results, when compared with the increased output from a Frue. This machine not only gives better results at both ends of the belt (i. e. Clean product and poor tailings), but is operated at less expense and requires less attention than any other machine on the market. At the Alaska Treadwell Mine where they have ordered over 100 Frue Vanners one man attends 48 machines for 12 hour shift.

FOR DESCRIPTIVE PAMPHLETS, ADDRESS

JAS. S. BROWNELL, Western Agent

132 Market Street,

FRUE VANNING MACHINE CO.

(Successor to Adams & Carter)

SAN FRANCISCO, CAL.

MINERS' OUTFITS.



IRON MORTARS,
AMALGAM MORTARS,
GOLD WASH PANS,
MINERS' HORNS,
BATEAS, CRUCIBLES,
HORSE-SHOE MAGNETS
MAGNIFYING GLASSES
IRON RETORTS,
CHEMICALS, SCALES,
WEIGHTS, ETC

Including a full assortment of Mine and Mill Supplies, Assayers' Materials, Etc.

Sole Agents for the Pacific Coast for the



W. S. TYLER WIRE WORKS CO.
Manufacturers of

Steel and Brass Wire Battery Screens
Agents for Baker & Adamson's Chemically Pure Acids. A full Stock always on hand.

Nitric Acid, sp. gr. 1.42; Muriatic Acid, sp. gr. 1.30; Sulphuric Acid, sp. gr. 1.845.

JOHN TAYLOR & CO.

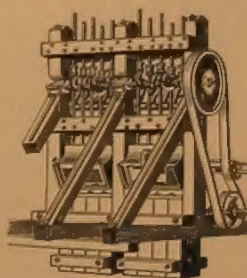
63 FIRST ST., SAN FRANCISCO

Prices on application.

The F. M. Davis IRON WORKS CO.

Office and Works 723 to 743 Larimer Street

Corner 8th Street, DENVER, COL.



Our Stamp Mills from 500 lbs to 1,000 lbs. Stamps are strictly up to date. Furnished with Steel or Semi-steel wearing parts, heavy mortars of late improved design, with or without steel linings, as desired, and the Davis Patent Self-Tightening Cam of High-Grade Open-Hearth Steel, and High-Grade Forged-Steel Cam Shafts and Stems.

They are designed with great care by engineers familiar with the best previous practice and knowing just what is wanted to render satisfactory service.

Send for Catalogue and Prices.



Cut Shows Robins Belt Conveyor
Handling 1100 tons per hour
of Rock and Gravel on

River Dredge

For 1899 catalogue description of system
Write to

Robins Conveying Belt Co.

147 Cedar Street, New York City

GOODSELL'S "98" PUMP PACKING



WAX END SEWED.

Patent Pending

No possibility of Splitting. All imperfect features of Duck packing overcome. Price 75c lb net.

Goodsell Packing Co.,

SOLE AGENTS

33 South Canal Street

Chicago, Illinois

SWEEPINGS ★

Metallic Wastes, Dental Scraps,
Photographers' Wastes,
Jewelers' Sweepings, Mill Wastes,
Amalgamated Plates, Old Iron Retorts,
Old Quicksilver bought.

A. M. DONALDSON & CO.,
1661 Larimer St., Denver, Colorado

The Little Alaska Gold Washer



A simple, practical, indestructible gold washer, combining the principles of gravity and centrifugal motion, and at a price and weight far below any washer ever invented. In working the operator does not have to wet his hands nor hold the weight of the dirt in his arms. These washers have been used on the desert for the last 18 months with water at \$1.50 per barrel. Under ordinary conditions the rate of working is a pan a minute, and under all conditions the result is always the same IT SAVES ALL THE GOLD.

Send for catalogue and information to

RUSSELL & KINSEY,

204 South Broadway,

Los Angeles, Cal.

THE CUMMER DRYERS.

**FOR DRYING ...
... EVERYTHING
MECHANICALLY**

Concentrates, ores, coal, bricks, clay, etc.
No Steam is used.

Hundreds in Operation

F. D. CUMMER & SONS CO.,

CLEVELAND, OHIO

State Ore Sampling Co.

DENVER, COLORADO.

We buy Gold, Silver, Lead, Copper, Blomouth, Uranium, Wolframite, Cobalt molybdenite and Antimony Ores.

We have modern mills for sampling ore. We also test ore for the new processes of reduction. Our long experience in the market enables us to pay the highest cash prices for all marketable ore. Write for our "Reference Book." Send analysis of your ore for prices and information.

BAILY & MONNIG, Managers.

Horace F. Brown, M. E.

Mechanical Roasting, Cooling and Conveying of Ores. Automatic milling plants adapted to standard processes.

699 Washington Boulevard

CHICAGO, ILL.

READ OUR
WANT ADS

PAGE 8a

WHITE, ROGERS & COM'Y.

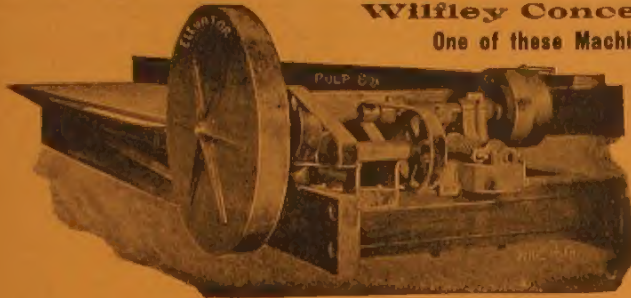
CONSTRUCTING ENGINEERS AND MILLWRIGHTS

306 PINE STREET, SAN FRANCISCO, CAL.

Sole Pacific Coast Agents and Builders of the Celebrated

Wilfley Concentrator, Price \$450 f.o.b. San Francisco

One of these Machines will take the place of TWO or THREE Belt Concentrators of any make and do very much better work.

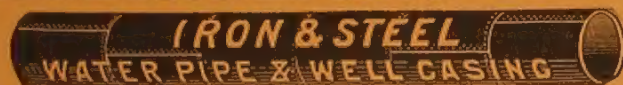


We furnish superior Machinery and erect Stamp Mills, Hoisting and Pumping Works operated by Steam or Water Motors. Complete Concentrating and Smelting Plants for the concentration and recovery of gold, silver, copper and lead. Improved Power Drills and Air Compressors, Wire Rope Tramways, etc.

The Wilfley Table is fully covered by U. S. Patents Nos. 580,335 and 590,675. Infringements will be prosecuted to the full extent of the law.

These Machines are Kept in Stock Ready for Immediate Shipment

THE NATIONAL IRON WORKS



Riveted Boilers, Tanks, and Sheet Steel or Iron Work of every description.

MANUFACTURER OF THE

National Steel Ore Car

Repairing of All kinds Promptly Attended to.
PORTLAND, OREGON

FULTON ENGINE WORKS

Mining, Milling & Smelting Machinery

Estimates Furnished on all Classes of Mining Work

P. O. Box 296, STATION "C"

LOS ANGELES, CALIFORNIA

BULLOCK DIAMOND DRILLS

If you are interested in prospecting, send for our new Catalogue No. 33.

BULLOCK MINING MACHINERY

Hoists and Haulage Plants, Mine Ventilators, Cars, Skips, Cages.

Write for What You Want.

PARKE & LACY CO., AGENT

306 BYRNE BLDG., LOS ANGELES, CAL.

M. C. BULLOCK MFG. CO.,

1169 W. LAKE ST., CHICAGO, U.S.A.

Established 1887

B. Sc. Members American Chemical Society

WADE & WADE ASSAYERS

Chemical Analysis, Milling, Concentration and Cyanide Tests

Call and See our Stamp Mill and Frue Vanner

115½ N. MAIN ST., LOS ANGELES, CAL.

Cyanide Potassium

99 per cent. pure, Beckton Brand,

MADE BY THE

Gas Light and Coke Co., London,

AND ALL OTHER CHEMICALS.



Please Apply to

Schoelkopf, Hartford & MacLagan, Ltd.,

100 William St., New York.

JENA Normal Glass
Trade Mark
BEST GLASS FOR Laboratory use
SCHOTT & GEN.
JENA

CHEMICALS AND
CHEMICAL APPARATUS

ASSAY BALANCES
Finest Ever Made

Specialties:—Analytical Portable Balances, Porcelainware, Platinum goods, Crucibles, Cupels, Scorifiers, Muffles, Furnaces, C. P. Acids, etc.

Everything Necessary for Assayers

Eimer & Amend,

3d Ave. Cor of 18th St. New York

U. S. AUTOMATIC INJECTORS

Guaranteed to be the

Best and Most Economical

Injectors on the Market

Can be had of



Mitchell Staver & Lewis Co., Portland, Or.
Mitchell Staver & Lewis Co., Seattle, Wash.
Schaw-Ingram Batchelor Co., Sacramento, Cal.
Henshaw, Bulkley & Co., San Francisco, Cal.
And of Jobbers and Dealers generally.
Catalogue Free.

American Injector Co.,

Detroit, Mich.
U. S. A.

A. H. HANDLAN,
President and Manager

E. W. HANDLAN,
Secretary and Treasurer

M. M. BUCK MFG. CO.

Railway and Contractors Supplies

Machine Tools, Heavy Hardware and Metals; Mine, Mill, Smelter and Foundry Supplies; Manufacturers of Locomotive Head Lights; Train and Station Signal Lights, Lanterns, Oil Filters, Lubricators, Injectors, &c.

92 North 3d Street,

St. Louis, Mo.

The Pulsometer Steam Pump

"THE MINER'S FRIEND"

Often Imitated--Never Equaled

Over 20,000 In Use

RECENT IMPORTANT IMPROVEMENTS

The Handiest, Simplest and Most Efficient Steam Pump for General Mining Quarrying, Railroad, Irrigation, Drainage, Coal Washing, Tank-filling and for Pumping Back Liquids heavily impregnated with sediment. Muddy or gritty liquids handled without injury to the Pump.

AGENTS

PARKE & LACY CO., A. M. HOLTER BROS. CO., MITCHELL-STAVEL & LEWIS CO.
San Francisco, Cal. Melesa, Mont. Portland, Oregon.



CATALOGUE ON APPLICATION
CORRESPONDENCE SOLICITED

Pulsometer Steam Pump Co.

122 Greenwich Street, New York City

FRASER & CHALMERS

{ 133 Fulton Street,
Chicago, Illinois, U. S. A.
{ 43 Threadneedle Street,
E. C., London, England



Mining Machinery

STAMP MILLS
ROCK CRUSHERS
HUNTINGTON MILLS
SMELTING FURNACES
GRAY'S PATENT MINE CHAIRS
CONCENTRATORS
HOISTING ENGINES
ROASTING FURNACES
BALL PULVERIZERS

Exclusive Manufacturers of
**RIEDER PUMPS and
AIR COMPRESSORS**

For
UNITED STATES, CANADA,
MEXICO, SOUTH AMERICA,
ENGLAND, SOUTH AFRICA
AND AUSTRALIA.

The accompanying picture shows the Air Compressor we make

Fraser & Chalmers, GENERAL AGENTS FOR GREEN BLOWERS

JOSHUA HENDY MACHINE WORKS, Nos. 38 to 44 Fremont St.

SAN FRANCISCO, CAL.

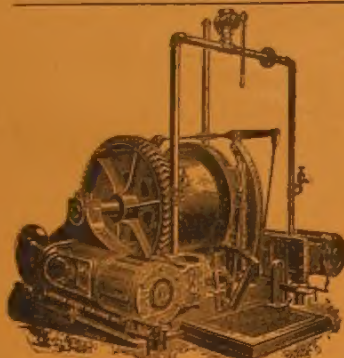
Manufacturers of and Dealers in

The Latest Improved

Quartz Milling, Pumping, Hoisting and Smelting
Plants, Air Compressors and Rock Drills.

"HENDY" IMPROVED "TRIPLE-DISCHARGE" TWO-STAMP QUARTZ MILLS
Boilers, Engines & Pumps of all capacities

PLANS, SPECIFICATIONS and ESTIMATES OF COST SUBMITTED and CONTRACTS ENTERED INTO
FOR FURNISHING and ERECTING MINING and MILLING PLANTS for all conditions of Use.



DOUBLE CYLINDER HOISTING ENGINE

BAKER IRON WORKS

LOS ANGELES, CALIFORNIA

Manufacturers of

Mining and Milling Machinery, Atlas Engines and Boilers, Worthington Steam Pumps

Water Works Machinery
A SPECIALTY

ESTABLISHED 1871

C. L. BERGER & SONS

Successors to

BUFF & BERGER

Mining and
Engineering Transits
With patent interchangeable
auxiliary, Telescope for use on
top or side in vertical sighting.
Our friends are cautioned
against infringements foreign
or domestic as attempts have
been made of late to mislead
the public.

Send for Illustrated Catalogue and Manual
11 Province Court, - Boston, Mass.



ANTIMONY.

We buy Antimony Ore in any quantity and pay prompt CASH for same. Write us and let us know what you have.

Chapman Smelting Works Co.,
(INCORPORATED)

429 Battery Street. San Francisco, Ca

Advertise your ...

* WANTS *

In THE JOURNAL

MINE AND MILL SUPPLIES

Steam and Gasoline Engines and Hoists

Giant Rock Drills

Ore Cars and Drills. Iron and Steel.

JOHN WIGMORE & SONS CO.

117-123 South Los Angeles St.,

Los Angeles, Cal.

Mining Timbers and Construction Lumber

(Calcasieu Long Leaf Yellow Pine Lumber)

Prices given for delivery to any point in Mexico by Rail through Porfirio Diaz, Nuevo Laredo or Paso del Norte, and by Vessel through Gulf Ports of Tampico and Vera Cruz.

Bradley-Ramsay Lumber Co.

LOUISIANA, U. S. A.

ADDRESS INQUIRIES FOR PRICES TO

R. N. WATSON, AGENT.

APARTADO NO. 118 MONTERREY, N. L. MEXICO

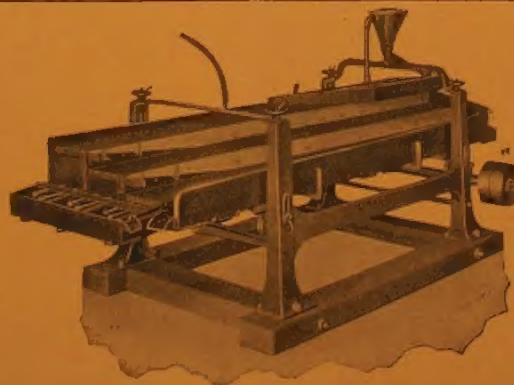
THE BARTLETT CONCENTRATING TABLE

One of these Machines will take the place of TWO or THREE Belt Concentrators of any make and do as good work. Separates ALL the minerals from each other at one operation. Gives THREE CONCENTRATES on the one Machine at the same operation. The Machine is especially adapted to the separation of Zinc and Lead.

Price, 12-ft. Table, \$350

Shipping Weight 2200 Pounds
Capacity, 10 to 30 tons per 24 hours

Licensee for the
Manufacture and Sale



Parties desiring tests made can send 500 lbs. or more, charges prepaid, and a run will be made and reports forwarded of the results free of all charges, except for the assay, which will not exceed \$10.00.

CAN BE SET UP ANYWHERE.
Requires No Special Foundation

Sole Agents for Ingersoll-Sergeant Rock Drills and Air Compressors, Knowles Pumps and Pulsometer Pumps, Bullock Diamond Drills.

Los Angeles, Cal. Office,
W. H. Miller, Representative
306 Byrne Building

PARKE & LACY COMPANY,

21 and 23 Fremont Street
SAN FRANCISCO, CAL.